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REVIEW

Xue-Ling Chang, Sheng-Tao Yang,
Chunying Chen et al.
Stable isotope labeling of nanomaterials for
biosafety evaluation and drug development

COMMUNICATION

Shuao Wang et al.
Efficient separation between trivalent
americium and lanthanides enabled
by a phenanthroline-based polymeric
organic framework

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Editorial

Professor Zhifang Chai: Scientific contributions and achievements

Yuliang Zhao^a, Chunying Chen^a, Weiyue Feng^b, Zhiyong Zhang^b, Diandou Xu^c,
Weiqun Shi^d, Shuao Wang^e, Yu-Feng Li^b

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Reviews

Stable isotope labeling of nanomaterials for biosafety evaluation and drug development

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Aoneng Cao^c, Chunying Chen^d

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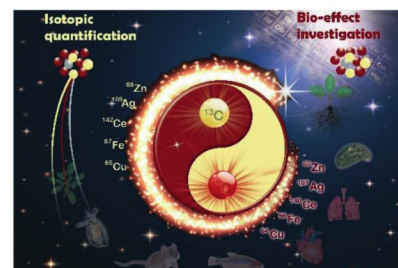
^b Key Laboratory of Pollution Control Chemistry and Environmental Functional Materials for Qinghai-Tibet Plateau of the National Ethnic Affairs Commission, School of Chemistry and Environment, Southwest Minzu University, Chengdu 610041, China

^c Institute of Nanochemistry and Nanobiology, Shanghai University, Shanghai 200444, China

^d CAS Key Laboratory for Biomedical Effects of Nanomaterials and Nanosafety and CAS Center for Excellence in Nanoscience, National Center for Nanoscience and Technology of China, and University of Chinese Academy of Sciences, Beijing 100190, China

We review the advances in the stable isotope labeling of nanomaterials for evaluating their environmental and biological effects. The labeling protocols, the advantages/disadvantages of stable isotope labeling, and the quantitative information of nanomaterials in environmental and biological systems are summarized. The challenges and future perspectives of stable isotope labeling in nanoscience and nanotechnology are discussed.

Chinese Chemical Letters 33 (2022) 3303



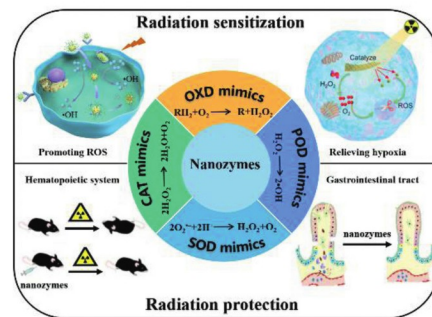
Emerging nanozymes for potentiating radiotherapy and radiation protection

Yu Chong, Jiayu Ning, Shengyi Min, Jiaquan Ye, Cuicui Ge

State Key Laboratory of Radiation Medicine and Protection, School of Radiation Medicine and Protection, School for Radiological and Interdisciplinary Sciences (RAD-X), Collaborative Innovation Center of Radiation Medicine of Jiangsu Higher Education Institutions, Soochow University, Suzhou 215123, China

Nanozymes have attracted much attention owing to their multi-enzyme activities and microenvironment-responsive feature. This review systematically illustrates the impressive progress of nanozymes for potentiating radiotherapy and radiation protection.

Chinese Chemical Letters 33 (2022) 3315



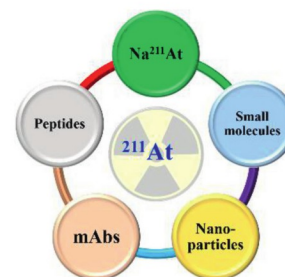
Recent progress of astatine-211 in endoradiotherapy: Great advances from fundamental properties to targeted radiopharmaceuticals

Feize Li, Yuanyou Yang, Jiali Liao, Ning Liu

Key Laboratory of Radiation Physics and Technology of the Ministry of Education, Institute of Nuclear Science and Technology, Sichuan University, Chengdu 610064, China

This work systematically introduced the progress of astatine-211 in endoradiotherapy, including the fundamental properties of astatine, the newly-developed ^{211}At labeling strategies, the preclinical and clinical advances of ^{211}At -based radiopharmaceuticals.

Chinese Chemical Letters 33 (2022) 3325



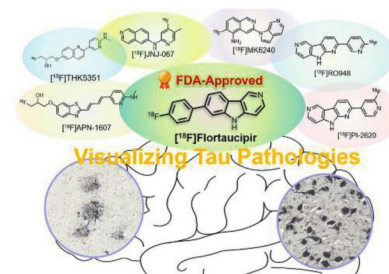
Recent development in selective Tau tracers for PET imaging in the brain

Yuying Li, Tianqing Liu, Mengchao Cui

Key Laboratory of Radiopharmaceuticals, Ministry of Education, Beijing Normal University, Beijing 100875, China

In the past few years, several Tau imaging tracers with different chemical scaffolds were developed for the early diagnosis of tauopathies. Among these tracers, ^{18}F Flortaucipir as the first Tau tracer was approved by the U.S. Food and Drug Administration in 2020. This review summarized the structural and biological characteristics of these tracers and discussed the future directions in this field.

Chinese Chemical Letters 33 (2022) 3339



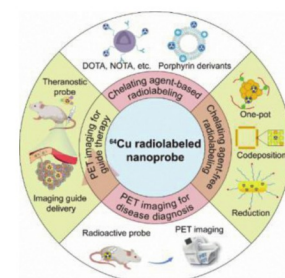
^{64}Cu radiolabeled nanomaterials for positron emission tomography (PET) imaging

Xueqian Chen, Wenchao Niu, Zhongying Du, Yong Zhang, Dongdong Su, Xueyun Gao

Department of Chemistry and Biology, Faculty of Environment and Life, Beijing University of Technology, Beijing 100124, China

We introduced in detail the design strategies and synthetic methodologies of various ^{64}Cu radiolabeled nanoprobe, mainly the latest developments and applications of chelating agent-free ^{64}Cu radiolabeled nanomaterials, and predicted their development trends.

Chinese Chemical Letters 33 (2022) 3349



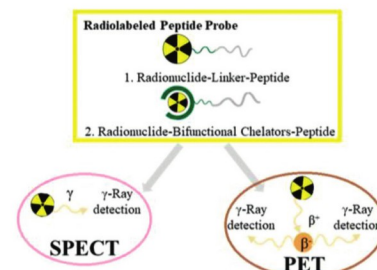
Radiolabeled peptide probe for tumor imaging

Ya-Qiong Yan, Hao Wang, Yuliang Zhao

CAS Center for Excellence in Nanoscience, CAS Key Laboratory for Biomedical Effects of Nanomaterials and Nanosafety, National Center for Nanoscience and Technology (NCNST), Beijing 100190, China

Radionuclide imaging such as PET and SPECT is now the premier imaging method in clinical practice for its high sensitivity and tomographic capability. Radiolabeled peptide probes as kinds of PET/SPECT tracers had become essential tools for clinical radionuclide diagnosis. This review mainly summarizes radiolabeled peptide probes for bioimaging.

Chinese Chemical Letters 33 (2022) 3361



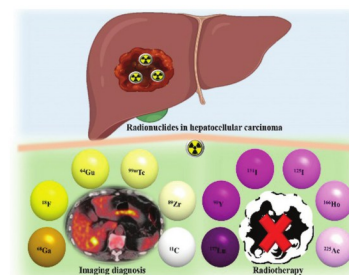
Advanced radionuclides in diagnosis and therapy for hepatocellular carcinoma

Hu Chen, Minglei Teng, Hongrui Zhang, Xiaoliu Liang, Hongwei Cheng, Gang Liu

State Key Laboratory of Molecular Vaccinology and Molecular Diagnostics, Center for Molecular Imaging and Translational Medicine, School of Public Health, Xiamen University, Xiamen 361005, China

Hepatocellular carcinoma is a kind of cancer with complex and diverse etiology. With the development of radionuclide applications in medicine, radionuclide-based imaging and radiotherapy are playing an increasingly important role in the diagnosis and treatment of hepatocellular carcinoma.

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Radioanalytical chemistry for nuclear forensics in China: Progress and future perspective

Yi Liu^a, Xuepeng Shao^a, Wenting Bu^a, Zhen Qin^b, Youyi Ni^a, Fengcheng Wu^a, Chuting Yang^a, Xiaolin Wang^c

^aInstitute of Nuclear Physics and Chemistry, China Academy of Engineering Physics, Mianyang 621000, China

^bInstitute of Materials, China Academy of Engineering Physics, Mianyang 621000, China

^cChina Academy of Engineering Physics, Mianyang 621000, China

This review summarizes the recent developments and applications of radioanalytical methods for nuclear forensics in China. The availabilities of actinide/lanthanide elemental and isotopic signatures for nuclear material source identification are highlighted.

Chinese Chemical Letters 33 (2022) 3384



The development of molecular and nano actinide decorporation agents

Xiaomei Wang, Cen Shi, Jingwen Guan, Yemeng Chen, Yigong Xu, Juan Diwu, Shuao Wang

State Key Laboratory of Radiation Medicine and Protection, School for Radiological and Interdisciplinary Sciences (RAD-X) and Collaborative Innovation Center of Radiation Medicine of Jiangsu Higher Education Institutions, Soochow University, Suzhou 215123, China

This review presents the state-of-the-art of molecular and nano actinide decorporation agents with special attention being paid on the correlation between the solution and solid-state chemistry of those agents with actinides and the corresponding decorporation efficacies.

Chinese Chemical Letters 33 (2022) 3395



China's progress in radionuclide migration study over the past decade (2010–2021): Sorption, transport and radioactive colloid

Zongyuan Chen^{a,b,c}, Siyuan Wang^c, Huijuan Hou^c, Kang Chen^c, Pengyuan Gao^c, Zhen Zhang^c, Qiang Jin^{a,b,c}, Duoqiang Pan^{a,b,c}, Zhijun Guo^{a,b,c}, Wangsuo Wu^{a,b,c}

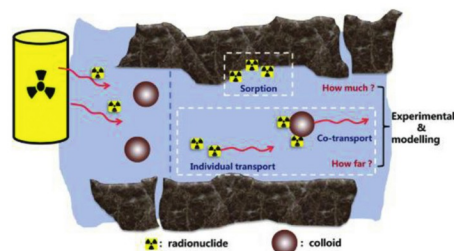
^aFrontiers Science Center for Rare Isotopes, Lanzhou University, Lanzhou 730000, China

^bThe Key Laboratory of Special Function Materials and Structure Design, Ministry of Education, Lanzhou University, Lanzhou 730000, China

^cRadiochemistry Laboratory, School of Nuclear Science and Technology, Lanzhou University, Lanzhou 730000, China

Significant progress has been achieved in China's RN migration studies over the past decade, especially regarding RN sorption, RN transport and radioactive colloid.

Chinese Chemical Letters 33 (2022) 3405



Opportunities and challenges of high-pressure ion exchange chromatography for nuclide separation and enrichment

Weixiang Xiao^b, Duoqiang Pan^{a,b}, Zhiwei Niu^b, Yang Fan^b, Sirui Wu^b, Wangsuo Wu^{a,c}

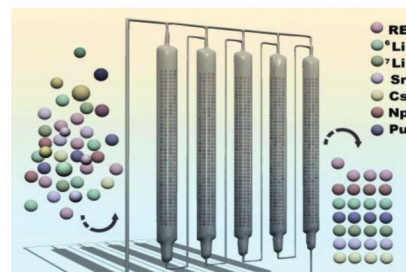
^aFrontiers Science Center for Rare Isotopes, Lanzhou University, Lanzhou 730000, China

^bSchool of Nuclear Science and Technology, Lanzhou University, Lanzhou 730000, China

^cKey Laboratory of Special Function Materials and Structure Design, Ministry of Education, Lanzhou 730000, China

The separation of radionuclides from radioactive liquid are essential for not only the recovery of valuable radionuclides, but also the purification treatment of radioactive waste water. High-pressure ion exchange chromatography has been widely accepted for the fine separation of elements and nuclides due to its advantages including high efficiency, environmental friendliness, ease of operation, and feasibility for large-scale industrial applications.

Chinese Chemical Letters 33 (2022) 3413



Communications

An effective process for the separation of U(VI), Th(IV) from rare earth elements by using ionic liquid Cyphos IL 104

Jiawei Lu, Kebao He, Yi Wang, Geng Chen, Hanqin Weng, Mingzhang Lin

School of Nuclear Science and Technology, University of Science and Technology of China, Hefei 230027, China

Fast and high-efficiency separation for U/Th from rare earth elements (REEs) by a homemade membrane emulsification circulation (MEC) extractor using Cyphos IL 104 as an extractant could be achieved with the extraction efficiency of more than 98.0% within 16 min. Besides, a complete process for extracting U/Th from REEs was proposed, where not only can U/Th be separated efficiently from REEs, but also the separation between U and Th was realized.

Chinese Chemical Letters 33 (2022) 3422



Efficient separation between trivalent americium and lanthanides enabled by a phenanthroline-based polymeric organic framework

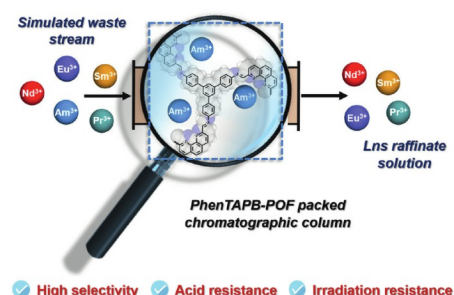
Afshin Khayambashi^a, Long Chen^a, Xue Dong^b, Kai Li^a, Zhipeng Wang^b, Linwei He^a, Suresh Annam^a, Lixi Chen^a, Yaxing Wang^a, Matthew V. Sheridan^a, Chao Xu^b, Shuao Wang^a

^aState Key Laboratory of Radiation Medicine and Protection, School for Radiological and Interdisciplinary Sciences (RAD-X) and Collaborative Innovation Center of Radiation Medicine of Jiangsu Higher Education Institutions, Soochow University, Suzhou 215123, China

^bInstitute of Nuclear and New Energy Technology, Tsinghua University, Beijing 100084, China

A highly stable POF material was designed and tested for Am/Ln separation for the first time, showing an unprecedented capability of quantitative enrichment of Am(III) from a Ln(III) mixture under combined extreme condition of high acidity and intense irradiation.

Chinese Chemical Letters 33 (2022) 3429



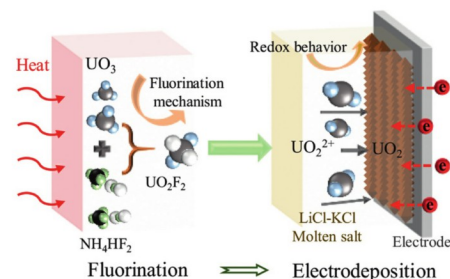
Fluorination reaction of UO_3 and electrochemical preparation of UO_2

Rugeng Liu, Yangyang Meng, Wenjing Ji, Wei Han, Mei Li, Yang Sun

Key Laboratory of Superlight Materials and Surface Technology, Ministry of Education, College of Material Science and Chemical Engineering, Harbin Engineering University, Harbin 150001, China

UO_3 obtained by high-temperature oxidation of spent fuel is first fluorinated to produce UO_2F_2 , and then UO_2F_2 is electrochemically reduced to the oxide fuel UO_2 in LiCl-KCl molten salt.

Chinese Chemical Letters 33 (2022) 3435



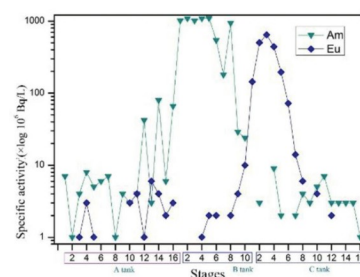
Studies on the separation treatment of high-level liquid waste by bisamide podand(I): Extraction and separation of An(III) from Ln(III)

Li-Kun Liu, Shu-Bao Xie, Hong-Bin Lv, Hu Zhang, Guo-An Ye

China Institute of Atomic Energy, Beijing 102413, China

A process for extraction and separation of An(III) and Ln(III) from HLLW in a hot test was proposed in which *N,N,N',N'*-tetraoctyl diglycolamide and tri-*n*-butyl phosphate (TODGA + TBP) was used as the extractant and 2,6-bis[1-(propan-1-ol)-1,2,3-triazol-4-yl]pyridine (PyTri-Diol or PTD) was used as the aqueous stripping agent.

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Stability of selenium and its speciation analysis in water using automatic system separation and HR-ICP-MS measurement

Junqiang Yang^{a,b}, Yawen Chen^{b,c}, Keliang Shi^{a,b,d}, Kesheng Hu^b, Run Li^e, Xiaoqing Gao^{b,f}, Qian Wang^b, Weibo Zhang^b, Yun Zhou^b, Yanyun Wang^b, Jiangang He^{a,b}, Tonghuan Liu^{a,b}, Xiaolin Hou^{a,b}

^a Frontier Science Center for Rare Isotopes, Lanzhou University, Lanzhou 730000, China

^b School of Nuclear Science and Technology, Lanzhou University, Lanzhou 730000, China

^c Beijing National Laboratory for Molecular Sciences, Fundamental Science Laboratory on Radiochemistry & Radiation Chemistry, College of Chemistry and Molecular Engineering, Peking University, Beijing 100871, China

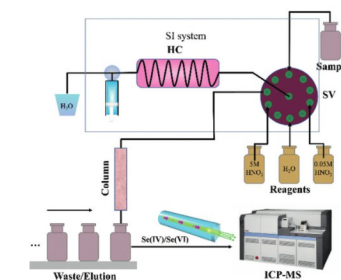
^d Key Laboratory of Special Function Materials and Structure Design, Ministry of Education, Lanzhou University, Lanzhou 730000, China

^e CNNC Lanzhou Uranium Enrichment Co., Ltd., Lanzhou 730000, China

^f Environmental Monitor Center of Gansu Province, Lanzhou 730000, China

A simple and convenient method has been developed for the pre-concentration and separation of inorganic selenium species from environmental water samples using anion exchange chromatographic column combined with HR-ICP-MS measurement. The stability volatility of selenium was investigated. Se(IV) and Se(VI) were separated successfully based on the batch experiments. The proposed method has been successfully verified using the certified reference materials (CRMs) and real water samples.

Chinese Chemical Letters 33 (2022) 3444



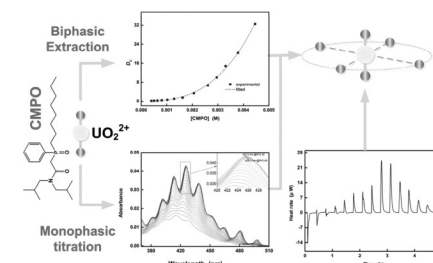
Complexation between uranyl(VI) and CMPO in a hydroxyl-functionalized ionic liquid: An extraction, spectrophotography, and calorimetry study

Baihua Chen, Jun Liu, Hongyuan Wei, Yuchuan Yang, Xingliang Li, Shuming Peng, Yanqiu Yang

Institute of Nuclear Physics and Chemistry, CAEP, Mianyang 621900, China

The complexation of uranyl(VI) with CMPO in a hydroxyl-functionalized ionic liquid 1-hydroxyethyl-3-methylimidazolium bis(trifluoromethylsulfonyl)imide (HOEtMimNTf₂) were studied by solvent extraction, spectrophotography, and calorimetry. The chelating fashions of CMPO molecules with uranyl(VI) were discussed according to the thermodynamics of the complexation reactions.

Chinese Chemical Letters 33 (2022) 3451



Visualized uranium rapid monitoring system based on self-enhanced electrochemiluminescence-imaging of amidoxime functionalized polymer nanoparticles

Ziyu Wang^a, Hang Gao^b, Peng Liu^a, Xinqi Wu^a, Qian Li^a, Jing-Juan Xu^b, Daoben Hua^{a,c}

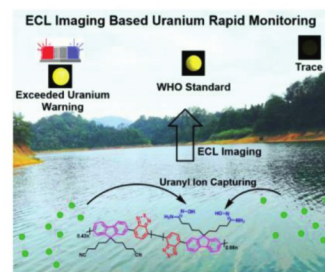
^a State Key Laboratory of Radiation Medicine and Protection, School for Radiological and Interdisciplinary Sciences (RAD-X), Soochow University, Suzhou 215123 China

^b State Key Laboratory of Analytical Chemistry for Life Science, School of Chemistry and Chemical Engineering, Nanjing University, Nanjing 210023, China

^c Collaborative Innovation Center of Radiological Medicine of Jiangsu Higher Education Institutions, Soochow University, Suzhou 215123, China

A visualized strategy is developed for accurate and rapid uranium monitoring by using a three-in-one conjugated polymer with self-enhanced electrochemiluminescence behavior, which gives an ultra-low limit of detection (0.5 ng/L) and high selectivity to uranium.

Chinese Chemical Letters 33 (2022) 3456



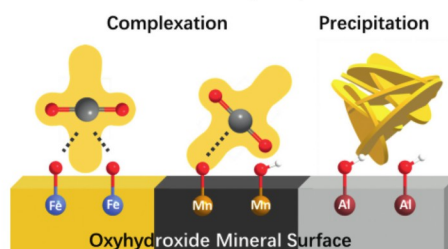
Uranium sorption on oxyhydroxide minerals by surface complexation and precipitation

Jingyi Wang, Wanqiang Zhou, Yanlin Shi, Yao Li, Dongfan Xian, Ning Guo, Chunli Liu

Beijing National Laboratory for Molecular Sciences, Fundamental Science Laboratory on Radiochemistry and Radiation Chemistry, College of Chemistry and Molecular Engineering, Peking University, Beijing 100871, China

Uranium sorption on Al-oxyhydroxide behaved differently from Mn- and Fe-oxyhydroxides, mainly through surface precipitation rather than surface complexation. The effects of solution pH and co-existing anions were discussed.

Chinese Chemical Letters 33 (2022) 3461



Nitrogen-rich carbon nitrogen polymers for enhancing the sorption of uranyl

Zeru Wang^{a,b}, Wenhao Li^{a,b}, Linzhen Wu^{a,b}, Zhuang Wang^c, Yalan Cao^a, Jingkai Cheng^{a,b}, Guangyuan Chen^{a,b}, Qian Zhao^{a,b,d}, Mei Jiang^{a,b,d}, Zhengguo Chen^e, Lin Zhu^{a,b}, Tao Duan^{a,b}

^a National Co-Innovation Center for Nuclear Waste Disposal and Environmental Safety, Southwest University of Science and Technology, Mianyang 621010, China

^b State Key Laboratory of Environment-friendly Energy Materials, School of National Defence Science and Technology, Southwest University of Science and Technology, Mianyang 621010, China

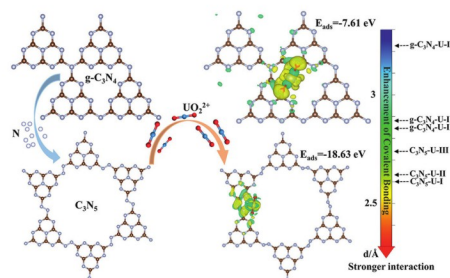
^c College of Chemistry, Sichuan University, Chengdu 610064, China

^d School of Physics and Astronomy, China West Normal University, Nanchong 637002, China

^e NHC Key Laboratory of Nuclear Technology Medical Transformation, Mianyang Central Hospital, Mianyang 621010, China

A nitrogen-enriched carbon-nitrogen polymer, C₃N₅, exhibits fast sorption kinetics, high selectivity and recyclability for U(VI). Combining with DFT calculation, the mechanism of nitrogen enrichment for enhancing the physicochemical sorption of U(VI) onto C₃N₅ was elucidated.

Chinese Chemical Letters 33 (2022) 3468



Isolation of ²¹²Pb from natural thorium for targeted alpha-therapy

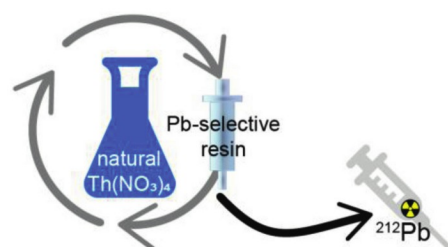
Junyi Chen^a, Mengxin Xu^a, Yu Liu^b, Dongban Duan^a, Yuxiang Han^a, Zhibo Liu^{a,b}

^a Beijing National Laboratory for Molecular Sciences, Radiochemistry and Radiation Chemistry Key Laboratory of Fundamental Science, College of Chemistry and Molecular Engineering, Peking University, Beijing 100871, China

^b Peking-Tsinghua Center for Life Sciences, Peking University, Beijing 100871, China

MBq-level of ²¹²Pb were successfully separated from commercially available thorium nitrate and applied to prepare several radiopharmaceuticals with high clinical impact, providing a new strategy for targeted alpha-therapy.

Chinese Chemical Letters 33 (2022) 3474



Building multipurpose nano-toolkit by rationally decorating NIR-II fluorophore to meet the needs of tumor diagnosis and treatment

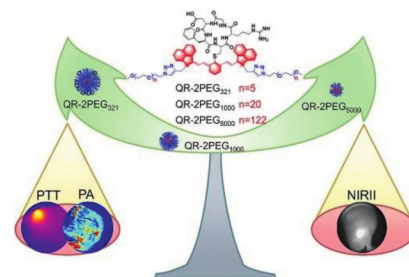
Chaoxiang Cui^a, Jiachen Li^a, Jing Fang^a, Yan Zhao^a, Yuqi Zhang^a, Shuyue Ye^a, Anna Wang^a, Yali Feng^a, Qiulian Mao^a, Hongni Qin^b, Haibin Shi^a

^aState Key Laboratory of Radiation Medicine and Protection, School for Radiological and Interdisciplinary Sciences (RAD-X) and Collaborative Innovation Center of Radiation Medicine of Jiangsu Higher Education Institutions, Soochow University, Suzhou 215123, China

^bSuzhou Industrial Park Institute of Services Outsourcing, Suzhou 215123, China

Three novel NIR-II probes were synthesized by conjugating different chain lengths of PEG onto an integrin $\alpha_v\beta_3$ -targeted NIR-II fluorophore for *in vivo* NIR-II imaging and photothermal therapy of tumors. These probes have been demonstrated to have a great potential for precise diagnosis and treatment of malignant tumors as a toolkit.

Chinese Chemical Letters 33 (2022) 3478



Laser ablation-single particle-inductively coupled plasma mass spectrometry as a sensitive tool for bioimaging of silver nanoparticles *in vivo* degradation

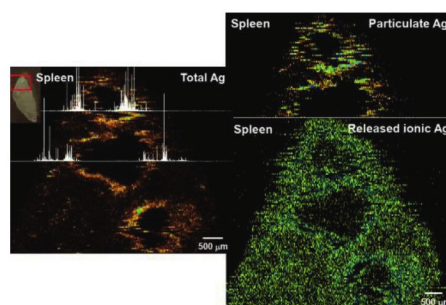
Meng Wang^a, Lingna Zheng^a, Bing Wang^a, Pu Yang^{a,b}, Hao Fang^{a,b}, Shanshan Liang^{a,b}, Wei Chen^{a,b}, Weiyue Feng^a

^aCAS Key Laboratory for Biomedical Effects of Nanomaterials and Nanosafety, Institute of High Energy Physics, Chinese Academy of Sciences, Beijing 100049, China

^bUniversity of Chinese Academy of Sciences, Beijing 100049, China

A method of laser ablation-single particle inductively coupled plasma mass spectrometry (LA-sp-ICP-MS) is shown to have high spatial resolution, sensitivity and accuracy for simultaneous imaging the *in situ* distribution of particulate Ag and released ionic Ag in the target organs after intravenous injection of Ag nanoparticles.

Chinese Chemical Letters 33 (2022) 3484



Broken electron transfer pathway in enzyme: Gold clusters inhibiting TrxR1/Trx via cell studies and theory simulations

Wenchao Niu^{a,b}, Zhongying Du^a, Chunyu Zhang^a, Deting Xu^{b,c}, Jiaojiao Li^a, Minghui Sun^{b,c}, Liyuan Wu^b, Haodong Yao^b, Lina Zhao^{b,c}, Xueyun Gao^a

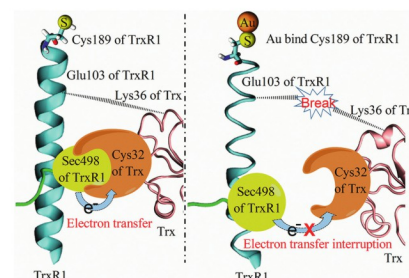
^aDepartment of Chemistry and Biology, Beijing University of Technology, Beijing 100124, China

^bCAS Key Laboratory for Biomedical Effects of Nanomaterials and Nanosafety, Institute of High Energy Physics, Chinese Academy of Sciences, Beijing 100049, China

^cUniversity of Chinese Academy of Sciences, Beijing 100049, China

Gold cluster inhibits TrxR1/Trx enzyme activity by breaking the native interaction between TrxR1 and Trx, which disrupts the electron transfer pathway from Sec498 of TrxR1 to Cys32 of Trx.

Chinese Chemical Letters 33 (2022) 3488



Facile preparation of ¹⁷⁷Lu-microspheres for hepatocellular carcinoma radioisotope therapy

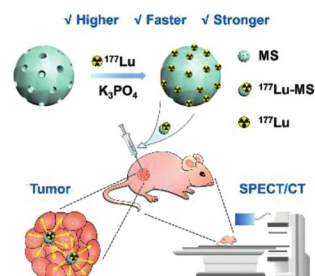
Manran Wu^a, Kexin Shi^a, Ruizhe Huang^a, Chunyi Liu^a, Lingling Yin^a, Weipeng Yong^a, Jing Sun^a, Guanglin Wang^a, Zhiyuan Zhong^b, Mingyuan Gao^a

^aState Key Laboratory of Radiation Medicine and Protection, School of Radiation Medicine and Protection & School for Radiological and Interdisciplinary Sciences (RAD-X), Collaborative Innovation Center of Radiation Medicine of Jiangsu Higher Education Institutions, Soochow University, Suzhou 215123, China

^bBiomedical Polymers Laboratory, College of Chemistry, Chemical Engineering and Materials Science, State Key Laboratory of Radiation Medicine and Protection, Soochow University, Suzhou 215123, China

A facile and efficient method was developed for preparing ¹⁷⁷Lu-microspheres, which may be useful for precise radioembolization therapy of hepatocellular carcinoma.

Chinese Chemical Letters 33 (2022) 3492



A novel peptide-based probe ^{99m}Tc -PEG₆-RD-PDP2 for the molecular imaging of tumor PD-L2 expression

Qi Luo^a, Yunwei Zhang^b, Zihua Wang^c, Yining Sun^d, Linqing Shi^b, Yue Yu^d, Jiyun Shi^d, Zhiyuan Hu^{c,e}, Fan Wang^{a,b,d}

^aGuangzhou Laboratory, Guangzhou 510005, China

^bMedical Isotopes Research Center and Department of Radiation Medicine, State Key Laboratory of Natural and Biomimetic Drugs, School of Basic Medical Sciences, Peking University, Beijing 100191, China

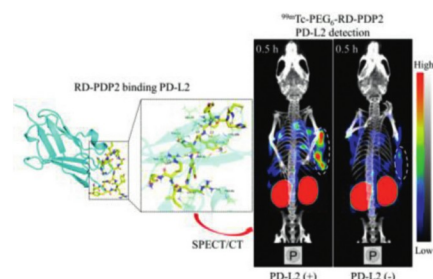
^cFujian Provincial Key Laboratory of Brain Aging and Neurodegenerative Diseases, School of Basic Medical Sciences, Fujian Medical University, Fuzhou 350122, China

^dKey Laboratory of Protein and Peptide Pharmaceuticals, CAS Center for Excellence in Biomacromolecules, Institute of Biophysics, Chinese Academy of Sciences, Beijing 100101, China

^eCAS Key Laboratory of Standardization and Measurement for Nanotechnology, CAS Key Laboratory for Biomedical Effects of Nanomaterials and Nanosafety, CAS Center for Excellence in Nanoscience, National Center for Nanoscience and Technology of China, Beijing 100190, China

A novel PD-L2-targeted SPECT peptide probe, ^{99m}Tc -PEG₆-RD-PDP2, was designed, developed and used for the non-invasive imaging of tumor PD-L2 expression, which has a great potential for guiding the anti-PD-1 or anti-PD-L1 immunotherapy of cancer.

Chinese Chemical Letters 33 (2022) 3497



Screening for a ^{177}Lu -labeled CA19-9 monoclonal antibody via PET imaging for colorectal cancer therapy

Jing Wang^{a,b,c}, Liangang Zhuo^a, Peng Zhao^a, Wei Liao^a, Hongyuan Wei^{a,d}, Yuchuan Yang^a, Shuming Peng^a, Xia Yang^{a,b,c}

^aInstitute of Nuclear Physics and Chemistry, China Academy of Engineering Physics, Mianyang 621900, China

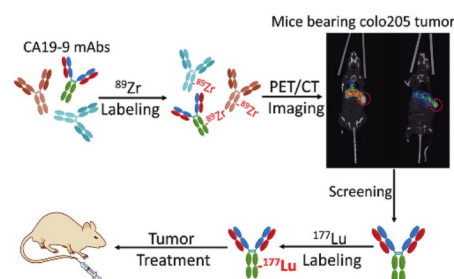
^bNHC Key Laboratory of Nuclear Technology Medical Transformation (Mianyang Central Hospital), Mianyang 621900, China

^cKey Laboratory of Nuclear Medicine and Molecular Imaging of Sichuan Province, Mianyang 621999, China

^dDepartment of Nuclear Medicine, The Affiliated Hospital Southwest of Medical University, Luzhou 646000, China

A ^{177}Lu -labeled CA19-9 monoclonal antibody was screened via PET imaging for colorectal cancer therapy.

Chinese Chemical Letters 33 (2022) 3502



Occurrence, evolution and degradation of heavy haze events in Beijing traced by iodine-127 and iodine-129 in aerosols

Miao Fang^{a,g}, Xue Zhao^{a,d,f}, Yixuan Liu^{a,g}, Yang Shao^b, Ning Chen^a, Min Luo^b, Luyuan Zhang^{a,e,f}, Qi Liu^a, Lingling Ma^b, Diandou Xu^b, Xiaolin Hou^{a,c,e,f}

^aState Key Laboratory of Loess and Quaternary Geology, Shaanxi Key Laboratory of Accelerator Mass Spectrometry Technology and Application, Xi'an AMS Center, Institute of Earth Environment, Chinese Academy of Sciences, Xi'an 710061, China

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^cDepartment of Environmental Engineering, Technical University of Denmark, Risø Campus, Roskilde 4000, Denmark

^dXi'an Institute for Innovative Earth Environment Research, Xi'an 710061, China

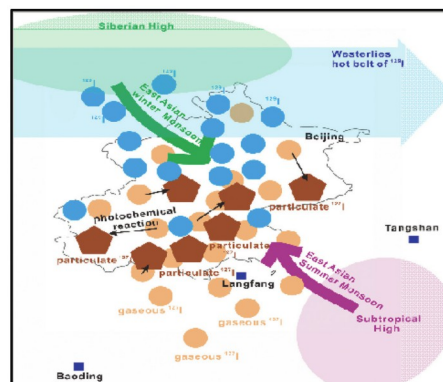
^eCAS Center for Excellence in Quaternary Science and Global Change, Xi'an 710061, China

^fOpen Studio for Oceanic-Continental Climate and Environment Changes, Pilot National Laboratory for Marine Science and Technology (Qingdao), Qiangdao 266061, China

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The source and pathway information of the corresponding air masses in the formation and evolution of haze events in Beijing was firstly traced by iodine-127 and iodine-129.

Chinese Chemical Letters 33 (2022) 3507



Exploration of the potential application of plutonium isotopes in source identification of sandstorm in the atmosphere of Beijing

Jie Ouyang^{a,b}, Yang Shao^a, Min Luo^a, Jilong Zhang^c, Xiongxin Dai^d, Lingling Ma^a, Diandou Xu^a

^a Beijing Engineering Research Center of Radiographic Techniques and Equipment, Institute of High Energy Physics, Chinese Academy of Sciences, Beijing 100049, China

^b Institute of Environmental and Health Sciences, College of Quality and Safety Engineering, China Jiliang University, Hangzhou 310018, China

^c State Nuclear Security Technology Center, Beijing 102401, China

^d China Institute for Radiation Protection, Taiyuan 030000, China

Plutonium concentration and isotope ratio in aerosol samples collected from Beijing was confirmed to be a potential tracer of sandstorm.

Chinese Chemical Letters 33 (2022) 3516



Direct search for primordial ²⁴⁴Pu in Bayan Obo bastnaesite

Yang Wu^a, Xiongxin Dai^{a,b}, Shan Xing^a, Maoyi Luo^{a,b}, Marcus Christl^c, Hans-Arno Synal^c, Shaochun Hou^d

^a China Institute for Radiation Protection, Taiyuan 030006, China

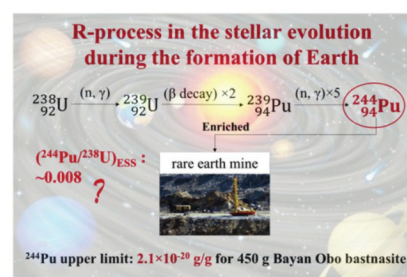
^b Collaborative Innovation Center of Radiation Medicine of Jiangsu Higher Education Institutions, Suzhou 215006, China

^c Laboratory of Ion Beam Physics, ETH Zurich, Zurich 8093, Switzerland

^d Baotou Research Institute of Rare Earths, Baotou 014030, China

The total primordial ²⁴⁴Pu in 450 g bastnaesite sample from Bayan Obo ore (China) was measured for attempting to verify the initial (²⁴⁴Pu/²³⁸U)_{ESS} abundance ratio (0.008) in the early formation of the solar system.

Chinese Chemical Letters 33 (2022) 3522



Two tetravalent uranium silicate and germanate crystals with three membered single-ring by molten salt method: K₂USi₃O₉ and Cs₂UGe₃O₉

Xu Zhang^{a,b}, Lei Zhang^a, Tao Bo^a, Shanen Huang^{a,c}, Zhiwei Huang^a, Weiqun Shi^d

^a Engineering Laboratory of Advanced Energy Materials, Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences, Ningbo 315201, China

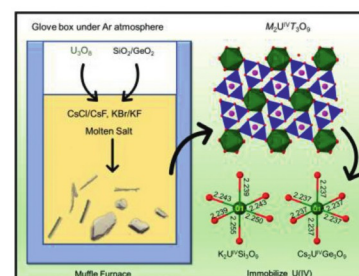
^b College of Nuclear Science and Technology, Harbin Engineering University, Harbin 150001, China

^c School of Energy and Power Engineering, Xi'an Jiaotong University, Xi'an 710049, China

^d Laboratory of Nuclear Energy Chemistry, Institute of High Energy Physics, Chinese Academy of Sciences, Beijing 100049, China

Two tetravalent uranium silicate and germanate M₂U^{IV}T₃O₉ (M = K, Cs; T = Si, Ge) crystals were crystalized under inert gas by molten salt flux growth method.

Chinese Chemical Letters 33 (2022) 3527



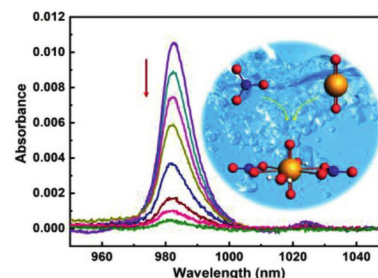
Optically "silent" neptunium(V)-nitrate complex in ionic liquid

Xue Dong, Zhipeng Wang, Qiang Yan, Haiwang Liu, Yuxiao Guo, Hong Cao, Jing Chen, Chao Xu

Institute of Nuclear and New Energy Technology, Tsinghua University, Beijing 100084, China

Np(V) and nitrate ions in ionic liquid can form a rare centrosymmetric 1:2 Np(V)/nitrate complex, which is optically "silent" because the center Np atom sits at the inversion center and the f-f transitions of Np(V) is forbidden.

Chinese Chemical Letters 33 (2022) 3531



Epoxy-POSS/silicone rubber nanocomposites with excellent thermal stability and radiation resistance

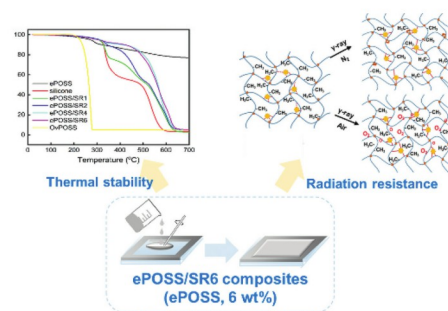
Mengni Shi^a, Yinyong Ao^b, Lei Yu^b, Lang Sheng^a, Shuangxiao Li^a, Jing Peng^a, Hongbing Chen^b, Wei Huang^b, Jiuqiang Li^a, Maolin Zhai^a

^a Beijing National Laboratory for Molecular Sciences, Radio Chemistry and Radiation Chemistry Key Laboratory of Fundamental Science, The Key Laboratory of Polymer Chemistry and Physics of the Ministry of Education, College of Chemistry and Molecular Engineering, Peking University, Beijing 100871, China

^b Institute of Nuclear Physics and Chemistry, China Academy of Engineering Physics, Mianyang 621900, China

Epoxy POSS/SR nanocomposites show excellent thermal stability and radiation resistance. The radiation induced crosslinking and degradation mechanism of epoxy POSS/SR was proposed by structural analysis and gas product analysis.

Chinese Chemical Letters 33 (2022) 3534



Hierarchical assembly of uranyl metallacycles involving macrocyclic hosts

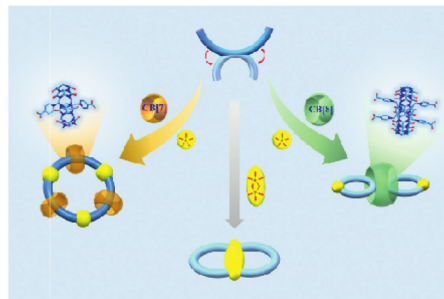
Yuanyuan Liang^{a,b}, Lei Mei^a, Qiuyan Jin^{a,b}, Junshan Geng^a, Jingyang Wang^a, Kang Liu^a, Kongqiu Hu^a, Jipan Yu^a, Weiqun Shi^a

^a Laboratory of Nuclear Energy Chemistry, Institute of High Energy Physics, Chinese Academy of Sciences, Beijing 100049, China

^b University of Chinese Academy of Sciences, Beijing 100049, China

A supramolecular inclusion-based method through introducing two different kinds of macrocyclic hosts, cucurbit[7]uril (CB[7]) and cucurbit[8]uril (CB[8]) are proposed to facilitate hierarchical assembly of uranyl metallacycles with higher complexity.

Chinese Chemical Letters 33 (2022) 3539



Synthesis and characterization of the two enantiomers of a chiral sigma-1 receptor radioligand: (S)-(+)- and (R)-(-)-[¹⁸F]FBFP

Tao Wang^a, Ying Zhang^a, Xiaojun Zhang^b, Leyuan Chen^c, Mingqiang Zheng^d, Jinming Zhang^b, Peter Brust^e, Winnie Deuther-Conrad^e, Yiyun Huang^d, Hongmei Jia^a

^a Key Laboratory of Radiopharmaceuticals (Beijing Normal University), Ministry of Education, College of Chemistry, Beijing Normal University, Beijing 100875, China

^b Nuclear Medicine Department, The First Medical Center of Chinese PLA General Hospital, Beijing 100853, China

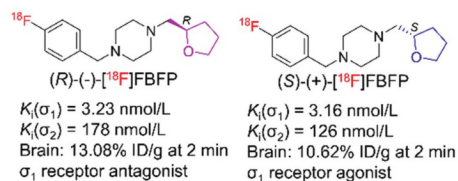
^c Institute of Radiation Medicine, Peking Union Medical College & Chinese Academy of Medical Sciences, Tianjin 300192, China

^d Yale PET Center, Department of Radiology and Biomedical Imaging, Yale University School of Medicine, New Haven, CT 06520-8048, United States

^e Helmholtz-Zentrum Dresden-Rossendorf, Institute of Radiopharmaceutical Cancer Research, Department of Neuroradiopharmaceuticals, Leipzig 04318, Germany

A very convenient synthesis of enantiomerically pure sigma-1 receptor ligands (S)-(+)-FBFP and (R)-(-)-FBFP with different pharmacological properties were developed. Both (S)-(+)-[¹⁸F]1 and (R)-(-)-[¹⁸F]1 possess suitable profiles with high brain uptake, high brain-to-blood ratios, high metabolic stability in the brain and high specific binding to the σ_1 receptors in rodents.

Chinese Chemical Letters 33 (2022) 3543



Experimental and theoretical insights into copper phthalocyanine-based covalent organic frameworks for highly efficient radioactive iodine capture

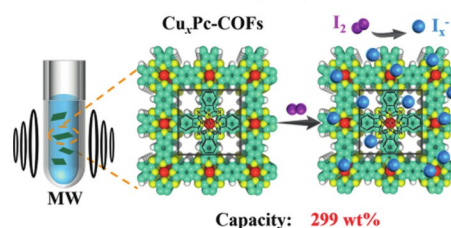
Xuewei Liu^a, Anrui Zhang^a, Ran Ma^a, Bo Wu^a, Tao Wen^a, Yuejie Ai^a, Mingtai Sun^b, Jie Jin^a, Suhua Wang^{a,b}, Xiangke Wang^a

^aMOE Key Laboratory of Resources and Environmental Systems Optimization, College of Environment and Chemical Engineering, North China Electric Power University, Beijing 102206, China

^bGuangdong Provincial Key Laboratory of Petrochemical Pollution Process and Control, School of Environmental Science and Engineering, Guangdong University of Petrochemical Technology, Maoming 525000, China

In this work, we developed a mild and efficient microwave irradiation method to prepare copper phthalocyanine-based covalent organic frameworks (Cu_xPc-COFs), which exhibited excellent iodine enrichment capacity (299 wt%) for volatile iodine. Due to charge transfer in the adsorption process, I₂ can gain charge to form polyiodide anions [I_x⁻].

Chinese Chemical Letters 33 (2022) 3549

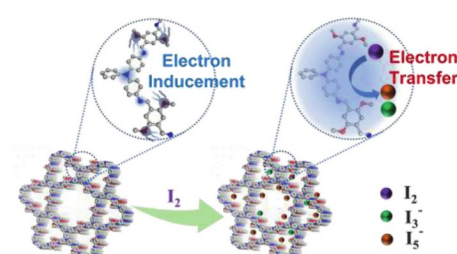


Efficient gaseous iodine capture enhanced by charge-induced effect of covalent organic frameworks with dense tertiary-amine nodes

Bo Jiang, Yue Qi, Xiaofeng Li, Xinghua Guo, Zhimin Jia, Jie Zhang, Yang Li, Lijian Ma
College of Chemistry, Sichuan University, Chengdu 610064, China

The adsorption affinity of the active site of covalent organic frameworks with multi-nitrogen nodes for iodine was successfully increased via the strategy of charge-induced effect and an adsorption capacity up to 5.54 g/g was achieved.

Chinese Chemical Letters 33 (2022) 3556



Temperature-responsive alkaline aqueous biphasic system for radioactive wastewater treatment

Chuanying Liu^{a,b}, Jianhui Lan^c, Qibin Yan^a, Zhipeng Wang^d, Chao Xu^d, Weiqun Shi^c, Chengliang Xiao^{a,b}

^aCollege of Chemical and Biological Engineering, Zhejiang University, Hangzhou 310027, China

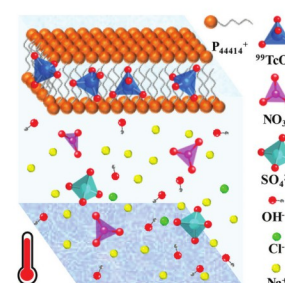
^bInstitute of Zhejiang University–Quzhou, Quzhou 324000, China

^cLaboratory of Nuclear Energy Chemistry, Institute of High Energy Physics, Chinese Academy of Sciences, Beijing 100049, China

^dInstitute of Nuclear & New Energy Technology, Tsinghua University, Beijing 100084, China

A temperature-responsive alkaline ABS based on P₄₄₄₁₄Cl was developed to remove pertechnetate from simulated radioactive tank waste water.

Chinese Chemical Letters 33 (2022) 3561



Effect of ligand initial conformation and counteranion on complexation behaviors of R-BTBP toward Pd(II) contained in highly active liquid waste

Lei Xu^{a,b}, Wenya Ding^a, Anyun Zhang^b, Ziyang Liu^c

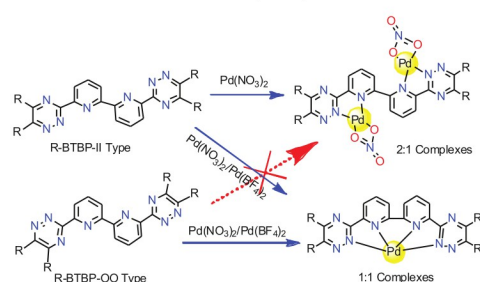
^aKey Laboratory of Nuclear Agricultural Sciences of Ministry of Agriculture and Zhejiang Province, Institute of Nuclear Agricultural Sciences, Zhejiang University, Hangzhou 310058, China

^bCollege of Chemical and Biological Engineering, Zhejiang University, Hangzhou 310027, China

^cCollege of Materials Science and Engineering, China Jiliang University, Hangzhou 310018, China

The speciation and structure of the 2:1 binuclear and 1:1 complexes of formed between Pd(II) and R-BTBP was depended on the initial conformation of R-BTBP molecules and counteranion of palladium salt.

Chinese Chemical Letters 33 (2022) 3565



ssDNA functionalized nanodiamonds for uranium decorporation

Qinglong Yan^{a,b,1}, Yu Miao^{c,1}, Xiaomei Wang^{c,1}, Jifei Ma^b, Juan Diwu^c, Ying Zhu^{a,b}, Shuao Wang^c, Chunhai Fan^d

^a Interdisciplinary Research Center, Shanghai Synchrotron Radiation Facility, Zhangjiang Laboratory, Shanghai Advanced Research Institute, Chinese Academy of Sciences, University of Chinese Academy of Sciences, Shanghai 201210, China

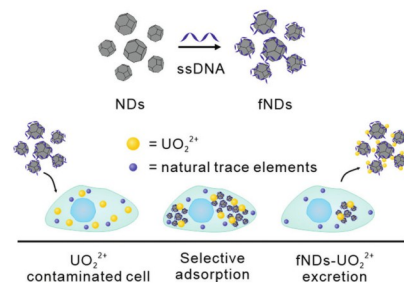
^b Shanghai Institute of Applied Physics, Chinese Academy of Sciences, Shanghai 201800, China

^c State Key Laboratory of Radiation Medicine and Protection, School for Radiological and Interdisciplinary Sciences (RAD-X) and Collaborative Innovation Center of Radiation Medicine of Jiangsu Higher Education Institutions, Soochow University, Suzhou 215123, China

^d School of Chemistry and Chemical Engineering, Frontiers Science Center for Transformative Molecules and National Center for Translational Medicine, Shanghai Jiao Tong University, Shanghai 200240, China

This work demonstrates that nanodiamonds (NDs) loaded with ssDNA (fNDs) exhibit good uranyl adsorption selectivity, high cellular uptake, fast excretion, and effective decorporation of uranyl from rat renal proximal tubular epithelial cells (NRK-52E).

Chinese Chemical Letters 33 (2022) 3570



Carbon dots and carbon nitride composite for photocatalytic removal of uranium under air atmosphere

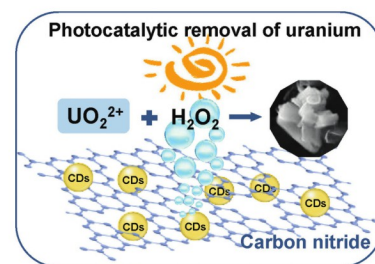
Hongpeng Li^a, Qi Qing^a, Liyuan Zheng^b, Lan Xie^b, Zhiqiang Gan^b, Liqin Huang^a, Shuang Liu^a, Zhe Wang^b, Yuexiang Lu^a, Jing Chen^a

^a Institute of Nuclear and New Energy Technology, Tsinghua University, Beijing 100084, China

^b The MOE Key Laboratory of Resources and Environmental System Optimization, College of Environmental Science and Engineering, North China Electric Power University, Beijing 102206, China

Carbon dots and carbon nitride composite material was synthesized for the photocatalytic removal of uranium. Under air atmosphere, H₂O₂ could be generated to react with uranyl ions to form UO₂(O₂)·2H₂O with a removal capacity higher than 1690 mg/g.

Chinese Chemical Letters 33 (2022) 3573



Synergy of photocatalytic reduction and adsorption for boosting uranium removal with PMo₁₂/UiO-66 heterojunction

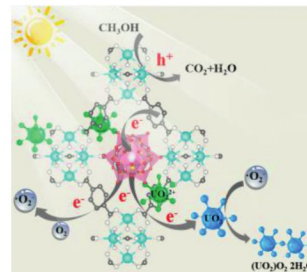
Zhibin Zhang^{a,b}, Zifan Li^{a,b}, Zhimin Dong^{a,b}, Fengtao Yu^{a,b}, Yingcai Wang^{a,b}, Youqun Wang^{a,b}, Xiaohong Cao^{a,b}, Yuhui Liu^{a,b}, Yunhai Liu^{a,b}

^a Jiangxi Province Key Laboratory of Synthetic Chemistry, East China University of Technology, Nanchang 330013, China

^b State Key Laboratory of Nuclear Resources and Environment, East China University of Technology, Nanchang 330013, China

The encapsulation of PMo₁₂ in the cavities of UiO-66 could boost both adsorption and photocatalysis for the extraction of U(VI).

Chinese Chemical Letters 33 (2022) 3577



Efficient photoreduction strategy for uranium immobilization based on graphite carbon nitride/activated carbon nanocomposites

Shuyang Li^b, Zhiwei Niu^{b,c}, Duoqiang Pan^{a,b}, Zhenpeng Cui^b, Hewen Shang^b, Jie Lian^b, Wangsuo Wu^{a,c}

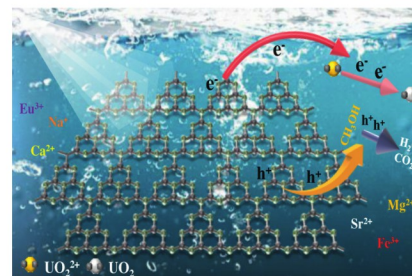
^a Frontiers Science Center for Rare Isotopes, Lanzhou University, Lanzhou 730000, China

^b School of Nuclear Science and Technology, Lanzhou University, Lanzhou 730000, China

^c Key Laboratory of Special Function Materials and Structure Design, Ministry of Education, Lanzhou 730000, China

Carbon nitride/activated carbon composite materials (CN/AC) were proposed for U(VI) reduction under visible light. The enhanced photocatalytic activity of CN/AC composites for U(VI) reduction benefits from the strongly interactive conjugated π bond structure between g-C₃N₄ and AC.

Chinese Chemical Letters 33 (2022) 3581



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