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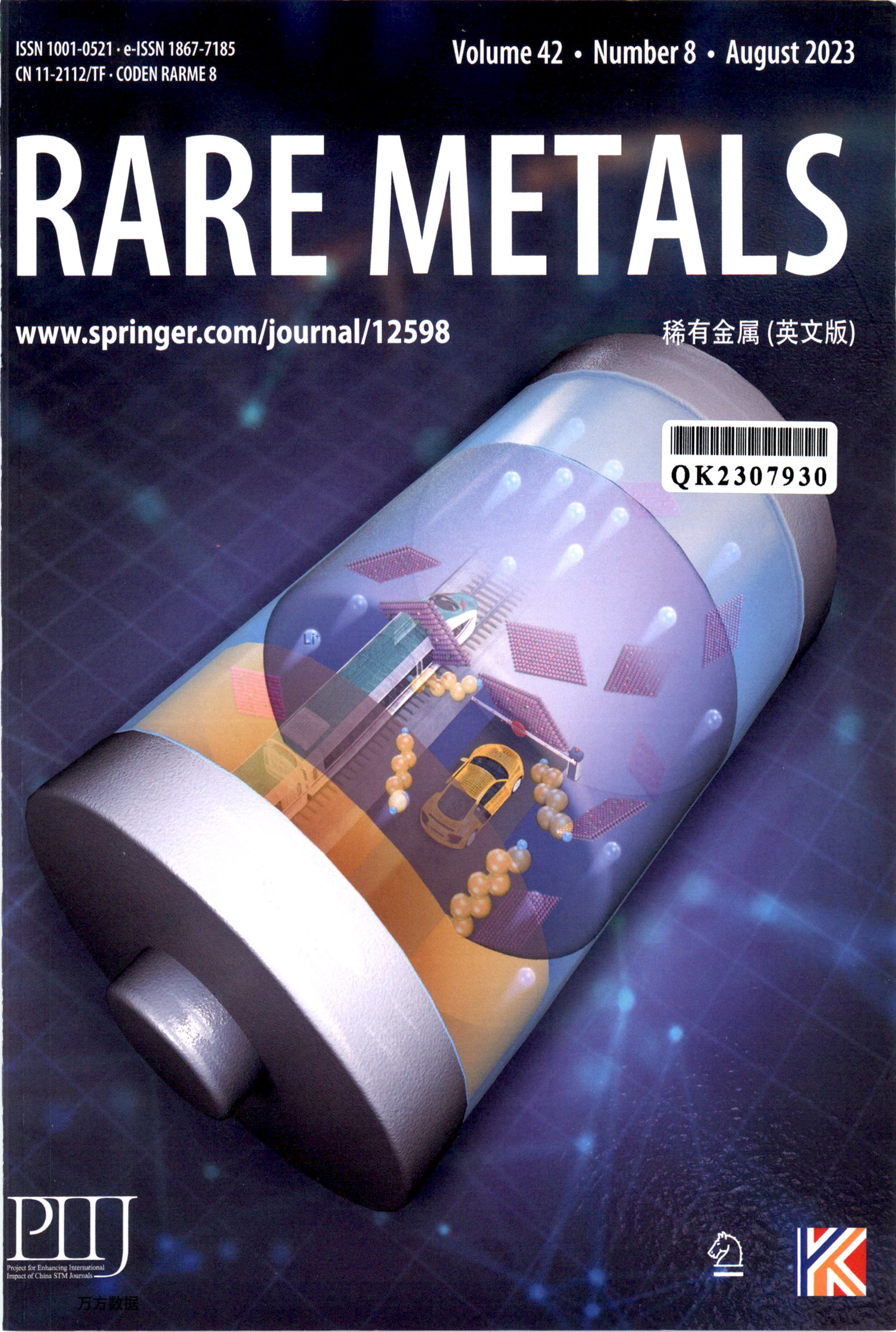

RARE METALS (Monthly)

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Cover Picture
S.-M. Liu et al. Nb_2CT_x MXene boosting PEO polymer electrolyte for all-solid-state Li-S batteries: two birds with one stone strategy to enhance Li^+ conductivity and polysulfide adsorptivity.

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Cover story

Nb_2CT_x MXene boosting PEO polymer electrolyte for all-solid-state Li-S batteries: two birds with one stone strategy to enhance Li^+ conductivity and polysulfide adsorptivity

(Si-Ming Liu, Meng-Xun Chen, Ying Xie, Deng-Hua Liu, Jin-Fei Zheng, Xiang Xiong, Heng Jiang, Li-Chang Wang*, Heng Luo* , Kai Han* pp. 2562–2576)

All-solid-state lithium-sulfur batteries have attracted significant attention due to their exceptional energy density and enhanced safety. However, the presence of polysulfides in PEO polymer electrolytes leads to the shuttle effect, along with the relatively low ionic conductivity of PEO electrolytes. To overcome these hurdles, we have successfully integrated Nb_2CT_x MXene into the PEO solid electrolyte and employed vacuum probe sonication to regulate its sheet size. The introduction of Nb–S bonding between Nb_2CT_x and polysulfides significantly improves the adsorption of polysulfides. Additionally, the reinforced interaction between the PEO matrix and the Nb_2CT_x MXene interface facilitates the efficient transport of Li^+. In the cover figure, the rapid conduction of Li^+ transport by Nb_2C, is represented by a high-speed train, while polysulfides are effectively adsorbed by Nb_2C, symbolized by a yellow car.

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