25e Congrès Général de la Société Française de Physique

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A New Superhard Nitride Superconductor

lundi 8 juillet 2019 17:30 (20 minutes)

We report the discovery of superconductivity in a new family of orthorhombic Tantalum nitride synthesised under high pressure and stable after pressure releasing, with a superconducting transition temperature T_c of 3K at ambient pressure, that reaches 9~K at 18~GPa. This compound exhibits a unique combination of structural and electronic properties, with a very high hardness combined with a significant ductility and high fracture toughness together with a superconducting phase. Interesingly, low oxygen content has been detected with a large effect on the T_c. This potential doping effect together with potential superconducting coupling via light element nitrogen ions phonons and strong covalent bonds makes this new family promising for the search of high-T_c light-element-based superconductors.

Choix de session parallèle

1.2 La supraconductivité par couplage électron-phonon dans les composé à éléments légers: vers la température ambiante?

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Classification de Session: Séance Parallèle