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Weyl phonons in transition-metal compounds TIANTIAN ZHANG, ZHIDA SONG, HONGMING WENG, CHEN FANG, LING LU, ZHONG FANG, Chinese Academy of Sciences (CAS) — Topological phononic crystal (TPC) is the solid-state material having nontrivial topology in its phonon spectrum.We propose that a family of transition-metal compounds be TPC and their phonon dispersions are predicted in ab initio calculations. The symmetry protected Weyl nodes and Dirac nodes at high symmetry momenta have been found by Wilson loop method and k.p model analysis.The open arcs of the isofrequency contour of the surface state extend across the whole surface Brillouin zone,distinguished from all known topological Weyl materials, including Weyl semimetals and Weyl photonic crystals.

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