

ABSTRACT

MXENE-COATED HARD CARBON-SOFT CARBON ANODE MATERIAL, PREPARATION METHOD AND USE THEREOF

5 The present application relates to the technical field of sodium-ion battery materials,
particularly to an MXene-coated hard carbon-soft carbon anode material, a preparation method
and use thereof. The structural stability between materials is enhanced by chemical reactions
between hydroxyl/carboxyl groups on the surface of the oxidized hard carbon precursor and
amino groups on the surface of the aminated asphalt to form amide groups connected by
10 chemical bonds. Simultaneously, the coupling effect of the silane coupling agent and silicon-
based materials obtained after carbonization are used to increase the specific capacity and the
energy density of the composite material. Through cross-linking and carbonization of the hard
carbon precursor and the soft carbon precursor by an amphoteric compound (amino acid) and
the coupling agent, and followed by coating with the surface-hydroxylated MXene, the
15 MXene-coated hard carbon-soft carbon anode material is obtained, which significantly
improves the high charge/discharge specific capacity, high first-cycle Coulombic efficiency,
excellent rate performance, and long cycle life of the battery.