

Title (en)  
INTERCALATION COMPOUNDS AND ELECTRODES FOR BATTERIES

Title (de)  
EINLAGERUNGSVERBINDUNGEN UND ELEKTRODEN FÜR BATTERIEN

Title (fr)  
COMPOSES D'INTERCALAIRE ET ELECTRODES POUR BATTERIES

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Application  
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Abstract (en)  
[origin: WO9956331A1] Intercalation compounds and in particular lithium intercalation compounds which have improved properties for use in batteries. Compositions of the invention include particulate metal oxide material having particles of multicomponent metal oxide, each including an oxide core of at least first and second metals in a first ratio, and each including a surface coating of metal oxide or hydroxide that does not include the first and second metals in the first ratio formed by segregation of at least one of the first and second metals from the core. The core may preferably comprise  $\text{Li}_x\text{MyNzO}_2$  wherein M and N are metal atom or main group elements, x, y and z are numbers from about 0 to about 1 and y and z are such that a formal charge on  $\text{MyNz}$  portion of the compound is (4-x), and having a charging voltage of at least about 2.5 V. The invention may also be characterized as a multicomponent oxide microstructure usable as a lithium intercalation material including a multiphase oxide core and a surface layer of one material, which is a component of the multiphase oxide core, that protects the underlying intercalation material from chemical dissolution or reaction. In a particular preferred example the multicomponent oxide may be an aluminum-doped lithium manganese oxide composition. Such aluminum-doped lithium manganese oxide compositions, having an orthorhombic structure, also form a part of the invention. In addition, the invention includes articles, particularly electrodes, for batteries formed from the compositions of the invention, and batteries including such electrodes. The invention further relates to a composite intercalation material comprising at least two compounds in which at least one compound has an orthorhombic structure  $\text{Li}_x\text{Al}_y\text{Mn}_{1-y}\text{O}_2$ , where y is nonzero, or a mixture of orthorhombic and monoclinic  $\text{Li}_x\text{Al}_y\text{Mn}_{1-y}\text{O}_2$ .

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