

Title (en)  
LITHIUM-ION-CONDUCTING MATERIALS

Title (de)  
LITHIUMIONENLEITENDE MATERIALIEN

Title (fr)  
MATÉRIAUX CONDUCTEURS AU LITHIUM-ION

Publication  
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Application  
**EP 13738426 A 20130116**

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Abstract (en)  
[origin: WO2013109622A1] Lithium-ion-conducting ceramic materials are disclosed having characteristics of high lithium-ion conductivity at low temperatures, good current efficiency, and stability in water and corrosive media under static and electrochemical conditions. Some general formulas for the lithium-ion-conducting materials include  $MI_{1+x+z-\delta}M_{III}xM_{IVa}yM_{IVb}2-x-yMVzP3-zO_{12}$  and  $MI_{1+x+4z-\delta}M_{III}xM_{IVa}yM_{IVb}2-x-y-zP3O_{12}$ , wherein MI comprises Li, Na, or mixtures thereof;  $0.05 < x < 0.5$ ,  $0.05 < y < 2$ ,  $0 < z < 3$ , and  $0 < \delta < 0.5$ ; Mm comprises Al, Hf, Sc, Y, La, or mixtures thereof; MIVa comprises Zr, Ge, Sn, or mixtures thereof; MIVb comprises Ti; and MV comprises Si, Ge, Sn, or mixtures thereof. In some cases, the lithium-ion conducting materials are formed through a process in which the materials' powdered precursors are milled after being calcined and before being sintered. The milling process may include using milling media of multiple sizes.

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