potentials, cells, elements (inorganic)

F 3000

05 - 014

Rechargeable Na/NaxCoO2 and Na15Pb4/NaxCoO2 Polymer Electrolyte Cells. — The P2 sodium cobalt bronze Na2CoO2 is used as cathode in cells with solid polymer electrolytes (polyethylene oxide) and sodium or Na15Pb4 anodes. NaxCoO2 reversibly intercalates sodium over the range 0.3 . ltoreq. $x \leq 0.9$, yielding theoretical energy densities of 1600 Wh/l (Na) and 1470 Wh/l (Na15Pb4), respectively. 100 cycles to $\geq$ 60% depth of discharge at 0.5 mA/cm2 and 200 shallower cycles at the same rate are obtained with these cells. In terms of cyclability, theoretical energy density, and rate capability, these cells show the best performance to date. Sodium polymer batteries therefore can be considered as practical alternatives for applications, in which cost control and performance are critical (e.g., in electric vehicles). — (MA, Y.; DOEFF, M. M.; VISCO, S. J.; DE JONGHE, L. C.; J. Electrochem. Soc. 140 (1993) 10, 2726-2732; Mater. Sci. Div., Lawrence Berkeley Lab., Univ. Calif., Berkeley, CA 94720, USA; EN)