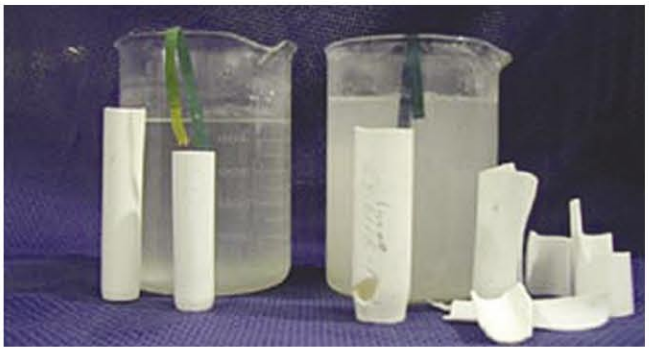
MSRI

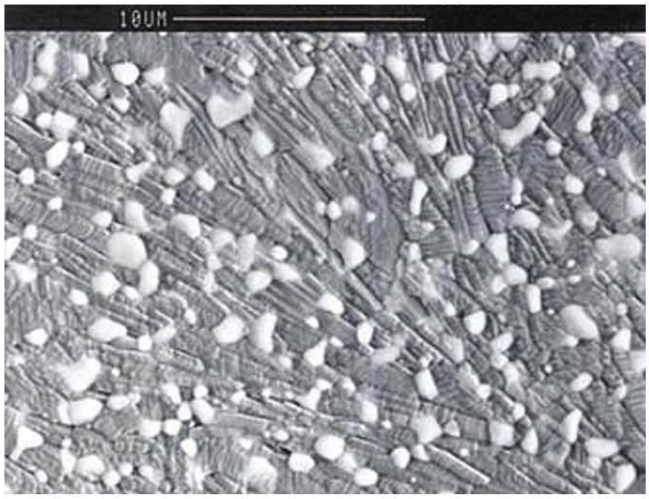
Materials and Systems Research, Inc.

ß-Alumina

ß-Alumina's layered crystal structure makes it an excellent ion conductor that is stable in corrosive, reducing and oxidative environments. Because of these properties it is ideal for many electrochemical applications, including: sodium sulfur batteries, alkali metal thermo electric converters (AMTEC), sodium heat engines (SHE), and sodium-nickel chloride (Zebra) batteries.

MSRI has developed a novel process for the fabrication of composite materials containing sodium, potassium, or rubidium ß- and "-alumina. By fabricating these materials at relatively low temperatures (1400-1450° C), MSRI's patented process avoids the formation of a transient liquid state. The presence





of the remnant liquid phases at grain boundaries renders materials made by conventional processes susceptible to water attack.

Materials made using MSRI's process result in two phases: zirconia (white) and ß"-alumina (dark). The inclusion of zirconia improves the strength of the material compared to conventional fabrication.

When standard ß-alumina tubes are boiled in water for four hours, significant degradation occurs (pH 13). MSRI's materials are devoid of grain boundary phases and are thus not susceptible to water attack. MSRI tubes were boiled for 12 hours with little degradation (pH 8)

For More Information Contact:
Materials and System Research , Inc.
5395 West 700 South
Salt Lake City, UT 84104

Phone: (801) 530-4987
Fax: (801) 530-4820
www.msrihome.com