

[物質生命化学]

32-28 Electrosubstitution at the Metal, Metal Compounds/ $\text{Na-}\beta''\text{-Al}_2\text{O}_3$ Interface in the SOED Method

大学院自然科学研究科 教授 松本 泰道
 大学院工学研究科 応用化学専攻 赤神 和昭
 物質生命化学科 助手 鎌田 海

The electrochemical reaction and electrosubstitution of a metal from the pure metal, its oxide, or its carbonate at the $\text{Na-}\beta''\text{-Al}_2\text{O}_3$ interface are very important as a cationic source in the solid oxide electrochemical doping (SOED) method, have been studied. Ag^+ was easily electrosubstituted for Na^+ in $\text{Na-}\beta''\text{-Al}_2\text{O}_3$ at a low applied voltage, but not the metal ions from metal oxides because of their strong binding energy. Some cations from their carbonates were substituted for Na^+ at a relatively low applied voltage. Consequently, some metal salts as well as pure metals can be useful as the electrode for a cationic source in the SOED method. The mechanism of the electrosubstitution is discussed.

Key Words : Electrochemical doping; β'' -alumina; oxide ceramics; ionic conductor.

(Academic Press, Inc. [Journal of Solid State Chemistry] Volume143, pp. 111-114, 1999)