THE SYNTHESIS AND TRANSPORT PROPERTIES OF K-INTERCALATION COMPOUNDS OF THE EXPANDED GRAPHITE

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Graphite Intercalation Compound (GIC) is obtained by intercalating various atoms or molecular species into the galleries between the host graphite crystalline layers. Alkali-Graphite Intercalation Compounds have attracted great interest because of their fascinating properties in catalysis¡¢storing hydrogen and superconductivity. But they haven't been in industrial use since 1926 in which they were firstly synthesized, for their property of unstable.

The expanded graphite with worm-like, accordion-like appearance can make potassium stay in the layers more stable because of its special structure. Under 450¡ætemperature which is determined by the eutectic point of the potassium and under vacuum, the 2-stage potassium expanded graphite intercalation compound have been synthesized. The stableness of this kind of GIC is well than unexpanded GIC. The K-EGIC can stay stable for 1-2 months under the condition of atmosphere. It is verified that the expanded graphite used as host material is effective. In this study, the K-EGIC's structure¡¢transport properties¡¢thermal analysis¡¢X-ray diffraction analysis and scanning electron microscopy(SEM) have been discussed systematically and find its properties have changed because of the potassium atom's intercalating and the expanded graphite's special structure. Factors that cause these changes have been discussed.

This research supplies a new method on how to enhance the stableness of GIC.Key words: Alkali-Intercalation Compound of Expanded Graphite, Expanded Graphite, Shape, Stableness, Electrical Conductivity