

Lithium Isotope Effect Accompanying Chemical Insertion of Lithium into Graphite

Satoru Hashikawa, Satoshi Yanase, and Takao Oi

Department of Chemistry, Sophia University, 7-1 Kioicho, Chiyodaku, Tokyo 102-8554, Japan

Reprint requests to Prof. T. O.; Fax: 81-3-3238-3359.

Z. Naturforsch. **57 a**, 857–862 (2002); received April 10, 2002

Lithium was chemically intercalated from 1-methoxybutane solution of lithium and naphthalene into graphite and *vice versa*, and lithium isotope fractionation accompanying those intercalation and deintercalation processes was observed. ^6Li was always preferentially fractionated into the graphite phase. The single-stage lithium isotope separation factor upon intercalation was about 1.023 at 25 °C, nearly independent of the structure of the lithium-graphite intercalation compounds formed. A much smaller separation factor was observed for the deintercalation process, suggesting the existence of lithium sites (surface areas) other than the sites between graphene layers of the host graphite. Separation factor data were consistent with the following decreasing order of the ^6Li -to- ^7Li reduced partition function ratio (RPFR): RPFR of 1-methoxybutane solution > RPFR of surface areas > RPFR of metal lithium > RPFR of graphene interlayer sites.

Key words: Lithium Isotopes; Isotope Effects; Intercalation; Single-stage Separation Factor; Lithium-graphite Intercalation Compounds.