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Lithium mineralization in Uljin area, Republic of Korea: geochemical vectoring perspective

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Lithium, as the lightest metal element, is a critical component in the new energy industry. With the development of electric vehicles that use Li-ion rechargeable batteries, the demand for Li resources is gradually increasing. In South Korea, lithium mineralization is found in pegmatites in Danyang and Uljin, and in volcanic rocks in Haenam. In this study, we aimed to investigate the distribution characteristics of rare-element pegmatites in the Uljin area, where lithium minerals are most commonly found, and to understand the origin of the deposits using geochemical vectoring and dating. The Uljin lithium-bearing pegmatites intrude Precambrian metasedimentary rocks and limestone strata in a northeast-southwest direction, and these pegmatites show a regional zonal distribution of mineral assemblages from west to east. To find fertile igneous bodies that may have formed the lithium-bearing pegmatites, we investigated igneous bodies within a 10 km radius of the lithium-bearing pegmatites [1], and performed whole-rock and trace element analyses and dating. We found igneous rocks that exhibit geochemical vectoring in the lithium-bearing pegmatites, as well as whole-rock element contents, element ratios, and trace element characteristics, but no fertile igneous rocks were found that correlate with the 172 Ma zircon U-Pb ages of the lithium-bearing pegmatites [2]. Gravity survey results suggest the presence of hidden igneous rocks near the lithium-bearing pegmatites, but further exploration drilling is needed.

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