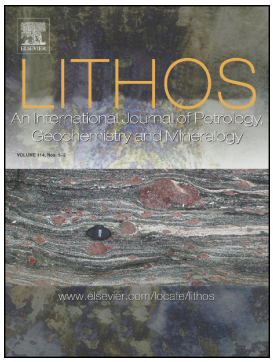

Magmatic age of rare-earth element and zirconium mineralisation at the Norra Kärr alkaline complex, southern Sweden, determined by U–Pb and Lu–Hf isotope analyses of metasomatic zircon and eudialyte

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Magmatic age of rare-earth element and zirconium mineralisation at the Norra Kärr alkaline complex, southern Sweden, determined by U–Pb and Lu–Hf isotope analyses of metasomatic zircon and eudialyte

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Abstract

The agpaitic Norra Kärr alkaline complex in southern Sweden is rich in heavy rare-earth elements and zirconium. Despite generally containing high concentrations of Zr, agpaitic rocks *sensu stricto* are devoid of igneous zircon. During the late stages of magmatic activity at Norra Kärr, metasomatic Na- and F-rich fluids transporting Zr complexes caused fenitisation (syn-magmatic alkali metasomatism) of the granitic wall rocks, which formed new metasomatic zircon. Fenite zircon was dated by LA-MC-ICP-MS with the U–Pb method at 1.49 ± 0.01 Ga, while the unaltered country rock granite was dated at 1.79 ± 0.01 Ga. Zircon in the fenites exhibits ε_{Hf} +6.58 ± 0.36 at 1.49 Ga; significantly