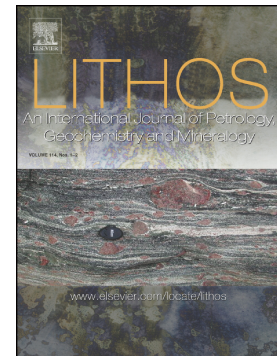


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**Magmatic age of rare-earth element and zirconium mineralisation at the Norra Kärr alkaline complex, southern Sweden, determined by U–Pb and Lu–Hf isotope analyses of metasomatic zircon and eudialyte**

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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  $1.49 \pm 0.01$  Ga, while the unaltered country rock granite was dated at  $1.79 \pm 0.01$  Ga. Zircon in the fenites exhibits  $\epsilon_{\text{Hf}} +6.58 \pm 0.36$  at 1.49 Ga; significantly

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