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## Near-isothermal exhumation of lower crust in the Caledonian Orogen: Metamorphic path of kyanite eclogite from the Danmarkshavn area, North-East Greenland Caledonides

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Kyanite eclogite from the North-East Greenland Caledonides – the upper plate of the Caledonian orogeny – preserves a mineral assemblage and petrographic texture that are consistent with an initial near-isothermal exhumation path. Two medium-grained kyanite eclogites from the Danmarkshavn area (76°46'N, 18°40'W) located west of the Germania Land shear zone contain the peak assemblage of garnet + omphacite + kyanite + phengite + amphibole + rutile. Subhedral garnet encloses monomineralic omphacite and polymineralic inclusions of clinopyroxene + plagioclase ± quartz ± amphibole ± K-feldspar ± kyanite. X-ray mapping of garnet indicates a homogenous core with a composition of  $\text{Py}_{51-52}\text{Alm}_{28-29}\text{Gr}_{19-20}\text{Sp}_{0-1}$ , along with a slightly zoned rim of  $\text{Py}_{54}\text{Alm}_{31}\text{Gr}_{15}\text{Sp}_1$  that is replaced by a corona of symplectitic amphibole + plagioclase. Omphacite ( $X_{\text{Na}}$  up to 0.41), rarely present in the matrix, is indicated by symplectite of clinopyroxene + amphibole + plagioclase. Symplectites of corundum + plagioclase, spinel + plagioclase and sapphirine + plagioclase replace former kyanite. These symplectites are typically surrounded by a plagioclase corona with decreasing Ca (from  $X_{\text{An}} = 92-97$  to  $X_{\text{An}} = 47-53$ ) from the symplectite to the matrix. Isochemical phase equilibrium modeling along with homogenous garnet core and peak omphacite compositions yielded a peak metamorphic pressure-temperature ( $P$ - $T$ ) condition at 1.9 GPa, 840 °C. Assuming local equilibrium at the microscopic scale, an attempt to model a symplectite of spinel + sapphirine + plagioclase after kyanite using a pseudosection yielded estimated  $P$ - $T$  conditions at 0.8–1.3 GPa and 700–900 °C. Integrating the calculated  $P$ - $T$  conditions and previous geochronological results, an initial exhumation path from 1.9 GPa to ~1.0 GPa from ~415–390 Ma to ~375 Ma is nearly isothermal at around 800 °C.