

**MINERALOGY OF ULTRAHIGH-PRESSURE ROCKS  
FROM THE NE GREENLAND CALODONIDES**

POWER, S.E.<sup>1</sup>, GILOTTI, J.A.<sup>1</sup> & McCLELLAND, W.C.<sup>2</sup>

<sup>1</sup>Department of Geoscience, University of Iowa, Iowa City, IA 52242 U.S.A

<sup>2</sup>Department of Geological Sciences, University of Idaho, Moscow, ID 83844 U.S.A.

e-mail: siobhan-power@uiowa.edu

The collision of Laurentia and Baltica at the final closure of the Iapetus Ocean during the Caledonian Orogeny resulted in the generation of ultrahigh-pressure (UHP) metamorphism at approximately 400 Ma in the Western Gneiss Region of Norway and ~50 Ma later in NE Greenland. The UHP terrane in Greenland is known from an island (Rabbit Ears Island) in Jøkelbugt off the northeast coast (78° 00' N, 18° 04' E). Here, eclogites occur as banded mafic boudins, surrounded by quartzofeldspathic orthogneiss with leucocratic pegmatites locally occurring in the boudin necks. Individual blocks are up to 50 x 100 metres in size and are traceable along the length of the island. Garnet rich paragneisses also occur. UHP mineral assemblages were identified in the host orthogneiss and in decimeter scale layers of kyanite-eclogite found in the mafic boudins. The UHP mineral assemblage in the kyanite-eclogite is garnet + omphacite + kyanite + phengite + rutile + coesite. The host gneiss has a disequilibrium assemblage of quartz + plagioclase + garnet + clinopyroxene + amphibole + biotite + kyanite + titanite + coesite. Solid inclusions in zircons were identified using laser Raman spectroscopy and Energy-Dispersive Spectroscopy (EDS). Zircons from both the eclogites and the gneisses are clear, sub-spherical and range in size from 100 to 400 micrometres in diameter. Inclusions in more than 1700 zircons were individually analysed using Raman spectroscopy, and from them, seven coesite inclusions were identified. The coesites are all clear, round crystals with diameters of 15 - 50 micrometres. While most zircons have multiply inclusions (> 4), coesite usually occurs on its own or with just one more. Further analysis using EDS shows that one coesite is part of a composite inclusion with clinopyroxene. The coesites occurred in three eclogite samples and one gneiss sample. In both the eclogite and the gneiss, zircons are mainly found enclosed in kyanite crystals but some grow at the grain boundaries of garnet and omphacite. Other eclogite facies minerals such as garnet, omphacite, kyanite and rutile were identified using EDS. They are abundant in zircons from all samples, garnet and omphacite having the greatest occurrences. Although the rocks are retrogressed, UHP minerals are best preserved and easily identified as inclusions in zircon.