Origin of four types of pargasitic amphiboles found from the *UHP* eclogite in Nové Dvory, Moldanubian Zone of the Bohemian Massif

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When basalts undergo extreme pressure-temperature (*P-T*) conditions, they tend to transform to anhydrous eclogites [1]. A bi-mineralic eclogite from Nové Dvory formed under >4GPa & 1000ºC [2] is a natural example predicted by [1]. In this study, four types of amphiboles (Amp-Ia/Ib/Ma/Mb) are observed in the bi-mineralic eclogite based on the mode of occurrence. Sporadic Amp-Ia appears with omphacite and rutile in polyhedral inclusions in garnet and seems to be equilibrated with garnet and omphacite. Amp-Ib appears with diopside and spinel as secondary inclusions in garnet. Amp-Ma/Mb occur between garnet and omphacite. Amp-Ma is not adjacent to plagioclase, but Amp-Mb is. The Amp-Ma formation is represented by an incipient alternation of garnet rim into a saw-blade shape fulfilled by Amp-Ma. The garnet rim is subsequently decomposed to a symplectite composed of diopside, spinel, and hematite. Similar symplectites occur occasionally on the garnet-side of Amp-Mb. Their boundary shapes like the saw-blade shaped rim of garnet, suggesting a transition of Amp-Ma to Amp-Mb. All amphiboles are pargasitic. Amp-Ia and Amp-Ma are K-free, while Amp-Ib Amp-Mb are K-bearing (<0.3pfu). Mg# ascends in the order of Amp-Ib (70-82), Amp-Ia (77-85), Amp-Mb (80-93), and Amp-Ma (87-92). All Amp contain F (<0.3pfu), but Cl is detected only in Amp-Ib (0.1-0.3pfu). The mode of occurrence infers a retrograde origin of Amp-Ib, Amp-Ma, and Amp-Mb. Because the study sample is composed mainly of garnet and omphacite, K, OH, F, and Cl in the secondary amphiboles should be supplied by fluids during retrograde stage. Neither OH- and F-pargasite are stable at pressure conditions over 4GPa [4]. It indicates Amp-Ia is a prograde relic that meta-stably survived the peak metamorphism of the Nové Dvory eclogite.

[1] Schmidt & Poli (1998) *EPSL* **163.1**, 361-379. [2] Nakamura et al. (2004) *JMG* **22.6**, 593-603 [3] Foley (1991) *Geochim. Cosmochim. Acta* **55.9**, 2789-2694