Title : Inderborite : a comprehensive reinvestigation of its technological features

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Inderborite is a hydrated borate (ideal formula:…) often found in lower fractions alongside with the five most important boron commodities *(i.e.,* colemanite, kernite, ulexite, borax, tincalconite). Nowadays, Turkish mines produce more than 70% of the worldwide B-minerals (*e.g*., Sarikaya borate deposits, Baysal, 1973). Hydrated borates have been listed as critical raw materials by the EU (EU Commission, 2017), and, because of the high neutron cross-section of B-10, they could be used as aggregates in neutron-shielding Sorel or Portland concretes, enhancing their adsorption towards thermal neutrons. In the forthcoming decades, with the advent of fusion power plants, it is predicted that substantial quantities of neutron-activated elements (*e.g*., beryllium or tungsten), will be produced (Gonzalez de Vincente et al. 2022). The main goal of this projects was to: *i)* re-investigate, by means of a multi-methodological approach, the crystal chemistry (with a focus on the B isotopic composition and trace elements) and structure of inderborite (even based on a single-crystal neutron diffraction experiment), *ii*) assess the stability range of inderborite with respect to pressure and temperature even for potential industrial utilization of this borates, *iii*) describe the structural evolution of inderborite, at the atomic scale, with increasing pressure and temperature.

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