

**MS15-2-15 Dypingite: phase identification and transformation**  
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**Abstract**

Dypingite is a naturally occurring mineral, with an empirical formula  $Mg_5(CO_3)_4(OH)_2 \cdot 5H_2O$ , and a member of the hydrocarbonate mineral group. It was named in 1970 by Gunnar Raade, after the Dypingdal serpentine-magnesite deposit in Norway [1]. Recently, it was reported that this mineral can effectively remove heavy metals (e.g., Cr, Cd, Cu, Pb, Ni [2]) from water and cause their long-term immobilisation [3]. It is expected that the unique desert rose morphology of the compound or/and peculiarities of its crystal structure are the reasons of the dypingite remarkable sorption properties. Despite the fact that this mineral has been known for 50 years, the information about its unit cell parameters, or even Bragg peak positions, is inconsistent and surprisingly limited. To partly fill this gap, we have been performing comprehensive structural and microstructural studies on the natural and synthetic dypingite powder samples to: i) identify a crystalline phase called dypingite; ii) correctly index powder X-ray diffraction (PXD) patterns so as to determine the compound unit cell parameters and to solve its crystal structure; iii) investigate the dypingite phase transformation occurring upon the compound hydration/dehydration.

**References**

1. Raade G, Dypingite, a new hydrous basic carbonate of magnesium, from Norway, *Am. Mineral.*, 55 (1970) 14572. Uzair MN, Feasibility Study on Heavy Metal Adsorption by Weathered Dunites with Emphasis on the Minerals Pyroaurite and Dypingite, Master thesis, University of Oslo, Norway, 2014.3. Hooper JC, Tracking the fate of nickel during transformation of nesquehonite to dypingite at 35°C, Bachelor thesis, Queen's University, Canada, 2019.

The desert rose morphology of dypingite



The PDX pattern of the dypingite mineral

