Crystallography of Vanadium-bearing Micas (Bol’shoy Karatau Range, Kazakhstan)

G. Bekenova¹, K. Dyussembayeva²
¹Department of Geological Exploration, Kaz NTU, Almaty, Kazakhstan
²
The mineralogical study of vanadium and vanadium-bearing micas from Cambrian carbonaceous-cherty formation of North-West of Bol’shoy Karatau range has allowed to establish four basic groups: 1. chernykhite (V2O3+V2O4 up to 23%); 2. Ba-roscoelite (V2O3 up to 18%) [1]; 3. vanadium-bearing muscovite and phengite (V2O3 up to 5%) and 4. secondary mica – V-Ba-phengite (V2O3+V2O4 up to 6-8%) [2]. Physical, optical properties as well as crystal structural parameters depend on vanadium content. The crystal structure of micas was determined by X-ray and electron diffraction techniques. The polytypes and unit cell parameter b (Å) are the main structural characteristics [3]. 2M1 polytype is spread among vanadium micas. Polytypes 1M and (1M+2M1) are only in vanadium-bearing micas – muscovite and phengite. The minimum b 9.03-9.04 Å is typical for this group. For secondary mica - V-Ba-phengite the parameter b varies from 9.6 to 9.09 Å. On the figure the secondary mica (1) is associated with mica without vanadium (2) and carbon-clay-cher (3) into polished section, where epoxy resin (4). For Ba-roscoelite b is equal 9.07-9.15 Å; for chernykhite - b 9.18 Å.


Keywords: carbonaceous-cherty formation, vanadium-bearing mica, polytype modification

![Image of polished section showing mica layers and epoxy resin]