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# Seminar

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■ **SPEAKER**

Prof. Evgeny Radzhabov (Institute of Geochemistry, Academy of Science of Russia)

■ **TITLE**

Spectroscopy of divalent samarium and electron transfer between lanthanides in alkaline-earth fluorides

■ **ABSTRACT**

Optical spectra (absorption, luminescence, decay of emission, spectra with time resolution) of Sm<sup>2+</sup> ions in alkaline-earth fluoride crystals (CaF<sub>2</sub>, SrF<sub>2</sub>, BaF<sub>2</sub>) in the wavelength range 120–900 nm at 7–300 K were studied. By additive coloration of about 60% of the original Sm<sup>3+</sup> is converted to Sm<sup>2+</sup>. The luminescence spectra of the slow and fast components in CaF<sub>2</sub>, SrF<sub>2</sub>, BaF<sub>2</sub> are similar, which confirms their attribution to forbidden 4f-4f and allowed 5d-4f transitions, respectively.

Forward electron photo-transfer and reverse thermal transfer between divalent and trivalent heterogeneous lanthanides in barium fluoride crystals has been studied using optical absorption. In crystals activated by two heterogeneous lanthanides and grown in reducing conditions, one of the lanthanides becomes bivalent whereas the other lanthanide remains trivalent. Illumination of the crystal in the ultraviolet bands led to the transfer of electrons from divalent lanthanides (Eu, Yb, Sm) to trivalent ions (Ho, Nd, Dy, Tm, Sm, Yb). The thermal ionization energies to the conduction band of created lanthanides are determined from the thermal bleaching curves of absorption bands. The experimental energies are compared with the estimated energies of the Dorenbos model.

■ **DATE AND VENUE**

November 13, 2019 (Wednesday, 5:00 - 6:00)  
Seminar Room A (116), KU R&D Center

■ **INVITED BY**

Professor Tai Hyun Yoon

■ **LANGUAGE**

English