

Radiation effects observed in quartz in uranium ores (1) - CL observation of quartz after He implantation and in uranium ores

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Under cathodoluminescence (CL), we can recognize light-colored halos in quartz adjacent to radionuclides-bearing minerals. The CL halos is theoretically considered to be formed by alpha particles from radionuclides-bearing minerals, identical to pleochroic halos in biotite. To clarify mode of development of halos, we carried out CL observation of quartz after He⁺ implantation, together with quartz in uranium ores. The observation of the quartz after implantation indicated that the formation of halo is due to alpha particles. The threshold of dose to observe CL halo under ordinary exposure condition is between $3.56\text{E-}05$ and $2.17\text{E-}06$ C/cm², which is consistent with the result from the uranium ores.