

Low temperature cathodoluminescence and low temperature thermoluminescence of quartz

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Luminescence phenomenon of quartz have been extensively investigated by many researchers. Especially cathodoluminescence (CL) and thermoluminescence (TL) have proved to be an invaluable techniques in sedimentary petrology for determining the diagenesis of sediments and in tephrochronology for the dating of volcanic sediments. The mechanisms responsible for the luminescence ,however, have not been sufficiently elucidated. It is resulted from the difficulty to evaluate the effects of luminescence centers due to many possible activators and many kinds of the proposed structural defects. Furthermore there are complicated effects such as fading of CL emission under prolonged irradiation and enhancement of CL intensity at low temperature. Because of very few of reliable CL and TL data at low temperature, we have measured CL spectra of natural and synthetic quartz at various temperatures and TL glow curves of X-ray induced samples at low temperature.