

The heterogeneity of color and the strain-hardening induced by the dislocations in jadeite

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The dusty blue jadeite from Kotaki River, Japan, has been analyzed from the viewpoint of geomaterials science, by using transmission electron microscopy (TEM) and electron probe microanalyzer (EPMA). The cell structure where dislocations are tangled is discovered in the blue area. Moreover omphacite is included in the same areas. When element maps by EPMA are performed on the texture with cell structure and the other dislocations, trace elements have been concentrated in the blue area where cell structures are observed. This concentration showed that heterogeneity of the color in jadeite is due to uneven distribution of the trace elements caused by dislocations. Furthermore measurement of Vickers hardness for omphacite with the cell structure in the blue area allowed Mohs hardness to be 6 to 6.5. This is higher than the hardness of omphacite reported until now. Therefore strain-hardening occurred in omphacite with the cell structure.