*Asian Journal of Chemistry* Vol. 22, No. 1 (2010), 823-825

***NOTE***

# Microstructure and Geochemical Investigations of Chalcedony

M. TEKBAS CANDAR
*The Ministry of Public Works and Settlement, Trabzon, Turkey*
*Tel: (90)(462)2211667; E-mail: mtekbascandar@gmail.com; minetekbascandar@hotmail.com*

Chalcedony from Turkey has been investigated by scanning-electron microscopy and petrographic microscopy. The geochemical analyses were also carrried out. Chalcedony is a microcrystalline variety of silica $SiO_2$. Wall-lining chalcedony is parallel fibrous consisting of smaller crystallites. Chalcedony is regarded as a secondary, metastable, transitional phase.

**Key Words: Chalcedony, SEM, Turkey.**

Natural chalcedony forms under near surface conditions at low temperatures. These conditions are restricted to sedimentary and low temperature hydrothermal environments. Further well recognized features are the common and widespread association with opal and similar material and the conversion of opal to chalcedony[1].

Chalcedony contains 1 to 2 wt % $H_2O$. Of this amount estimate that roughly half is present as intersititial molecular water, and half occurs as structural silanol group water (SiOH)[2].

Spherulitic chalcedony nucleates at distinct points along the cavity wall and microcrystalline fibers radiate toward the center of the vesicle. During the growth, these spherulites join to form uniform layers parallel to the cavity wall. Thus, this type of chalcedony is known as wall lining chalcedony[3].

Calcedony may precipitate directly from hydrosolution or occurs with amorphrous silica transformation to crystalline material. Chalcedony occurs below temperatures[4] of 180 °. Chalcedony occurs in either wall-lining or horizontal agate bands.

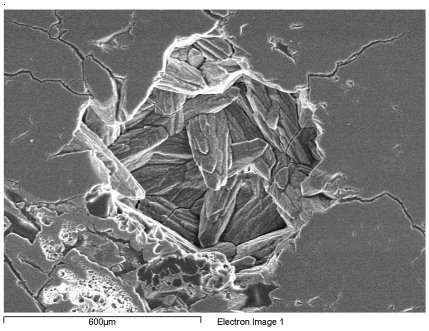


Fig. 1. Scanning electron photomicrograph of chalcedony

TABLE-1
ELEMENTAL ANALYSE OF CHALCEDONY

| Element | Weight (%) | Atomic (%) |
|---|---|---|
| O K | 51.04 | 64.64 |
| Al K | 1.37 | 1.03 |
| Si K | 47.59 | 34.33 |
| Total | 100.00 | |

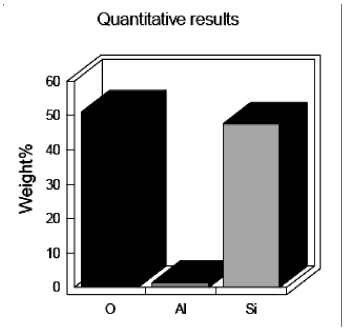


Fig. 2. Quantitative results of chalcedony

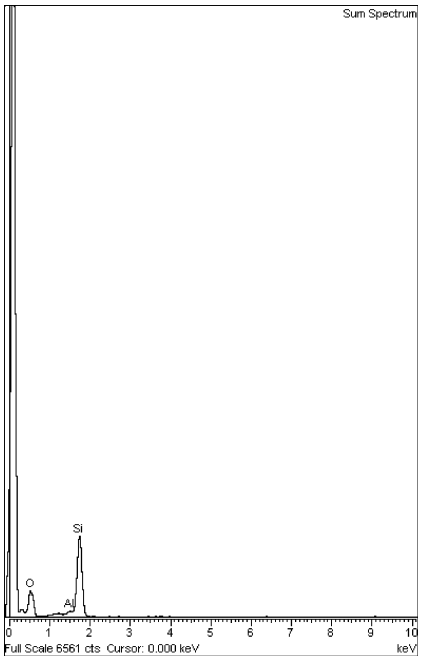


Fig. 3. Graphic belong to calcedony elementhal analyse

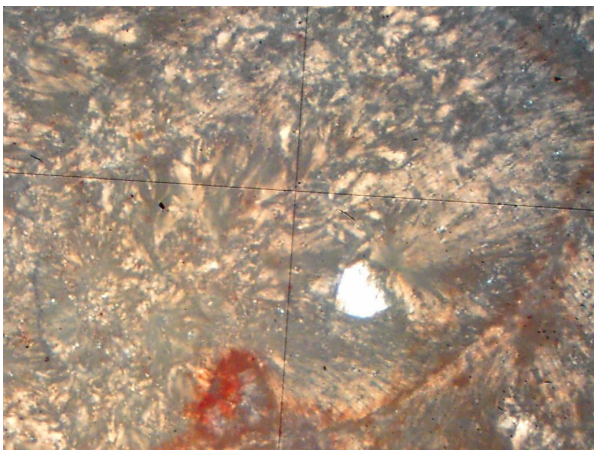

Fig. 2. Wall-lining growth of chalcedony

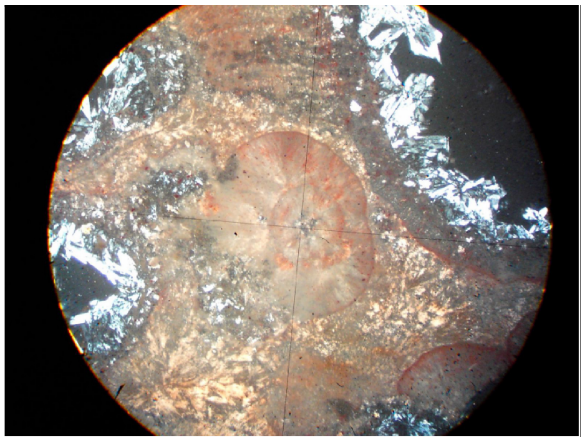

Fig. 3. In a horizontal layer

## REFERENCES

2. G. Miehe, H. Graetsch and O.W. Flörke, *Phys. Chem. Miner.*, **10**, 197 (1984).
1. J.F. White and J.F. Corwin, Synthesis and Origin of Chalcedony, The American Mineralogist, Vol. 46 (1961).
3. P. Heaney, *Contrib. Miner. Petrol*, **115**, 66 (1993).
4. R.O. Fournier, in eds.: B.R. Berger and Bethke, The Behaviour of Silica in Hydrothermal Solutions, Geology and Geochemistry of Epithermal Systems, Reviews in Economic Geology, Vol. 2, pp. 45-51 (1985).

(*Received*: 23 April 2009; *Accepted*: 16 September 2009) AJC-7909