

RAMAN SPECTROSCOPE AND STRUCTURE NATURE RYOLITE GLASSES

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Investigation of structure dry and hydrous glasses is important for understanding mechanism of solubility of water in natural glasses. Structures of obsidian and two perlites were studied by Raman spectroscopy.

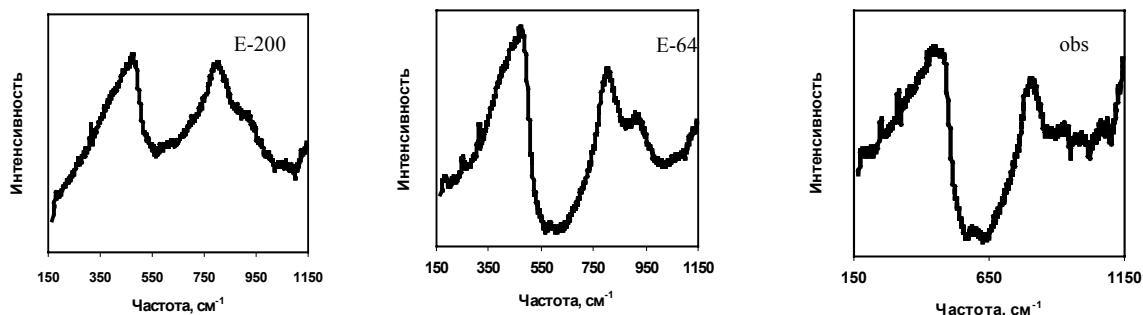


Fig.1. Raman spectra perlites E-200, E-64 and obsidian

RAMAN spectra of nature glasses (Fig.1) are similar to spectra alkali and alkali-alumina-silicate glasses. [1-3]. The strong bands are observed in low frequency and high frequency regions of Raman spectra of all samples.

Analyses of RAMAN data indicate that the structure of anhydrous and hydrous glasses is different. Structure of obsidian is more polymerization than structure of perlites. It is shown that degree of polymerization decrease with increasing concentrations of total water and hydrogen-bearing species.

Difference of degree of polymerization of perlite is due to different hydroxyl group's contents (table).

Table. Contents of water species

| Sample | Concentration of total water, wt. % | Concentration of molecular water, wt. % | Concentration of hydroxyl groups, wt. % |
|---------------|-------------------------------------|---|---|
| Obsidian | 0,3 | 0 | 0,3 |
| Perlite E-200 | 5,7 | 5,0 | 0,7 |
| Perlite E-64 | 6,3 | 4,7 | 1,6 |

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