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Solidi of alkaline aluminosilicate systems under H_2O/H_2-fluid pressure (P_{total}=2 kbar)

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The vapor-saturated solidi of $NaAlSi_3O_8$-H_2O-H_2, $NaAlSi_3O_8$-SiO_2-H_2O-H_2, and $NaAlSi_3O_8$-$KAlSi_3O_8$-SiO_2-H_2O-H_2 systems at 2 kbar over the entire range of gas phase composition from pure water to pure hydrogen were studied in the internally heated gas-media pressure vessel. In the experiments, various H_2O/H_2 compositions were controlled directly, rather than using a solid media buffers.

At addition of hydrogen to the considered H_2O-saturated systems a pronounced temperature minimum on solidus curves appears at $f(H_2)$=300-500 bars. The solidus temperatures decrease concerning H_2O-saturated systems on 22Ñ for Ab, 30Ñ for Ab-Qz, and 40Ñ for haplogranute (Ab-Or-Qz) system. At the further increase of $f(H_2)$ in H_2O-H_2 fluid the solidus temperatures increase reaching the maximum at pressure of pure hydrogen.

Data of X-ray photo-electronic spectra and ^{1}H, ^{29}Si, and ^{23}Na MNR spectra of Na-silicate and aluminosilicate H_2O and H_2O/H_2-saturated glasses show that H_2O/H_2-fluids in contrast to pure water call into action the pronounced depolarization of melts. It results in decrease the solidus temperatures.

For an estimation of hydrogen influence on formation granite melts and comparison with published data received with use of buffer reactions in system Fe-O the MW and WI buffers which use as indicators of $f(O_2)$ in natural and experimental processes have been investigated by the same technique. Experimental researches show that in the H_2O presence at MW and WI buffers the high values of $f(H_2)$ are reached. Hydrogen reacts with wustite and iron and the mixed compounds form. The monovariant

buffer reactions are transformed in the divariant fields. In the result, the stability of widely widespread in granites magnetite is considerably shifted to the reducing area.