The internal friction of hydrated soda-lime-silica glasses with total water content ($C_W$) up to 1.9 wt. % was studied by dynamic mechanical thermal analysis (DMTA) using temperature-frequency sweeps from 723 to 273 K and from 1 to 50 Hz. Total water content and concentrations of $H_2O$ molecules ($C_{H2O}$) and $OH$ groups ($C_{OH}$) in the DMTA specimens were determined by infrared spectroscopy. For low water contents ($C_W = C_{OH} < 0.25$ wt. %) two discrete internal friction peaks below the glass transition ($\alpha$ relaxation) were assigned to the low-temperature motion of alkali ions ($\gamma$ relaxation) and cooperative movements of dissimilar mobile species under participation of OH at higher temperature ($\beta_{OH}$ relaxation). For large water contents ($C_W > 1$ wt. %), where significant amounts of molecular water are evident ($C_{H2O} > 0.15$ wt. %), however, internal friction spectra change unexpectedly: the $\beta_{OH}$ peak heights saturate and a low temperature shoulder appears on the $\beta$-relaxation peak. This emerging relaxation mode ($\beta_{H2O}$ relaxation) was assigned to the motions of $H_2O$ molecules but contributions of proton-hopping cannot be excluded. $\beta_{H2O}$ relaxation was found to be faster than $\beta_{OH}$ but slower than $\gamma$ relaxation. Activation energy of the different relaxation modes increased in the order $\gamma < \beta_{H2O} < \beta_{OH} < \alpha$. 

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**DMTA study of hydrated soda-lime-silicate glasses**

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