

Title: Study of dynamical behavior of H₂O/D₂O mixtures by NMR relaxation

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Abstract: The subject of this diploma thesis is the chemical exchange in the mixture of light and heavy water, which was studied by methods of high resolution NMR. The first part of this thesis concerns methodology of sample preparation and methodology of measurement of relaxation times of mixture of light and heavy water. Experimental complications with elution of ions from tube glass, degassing of samples, radiation damping and sample heating by radio-frequency pulses were solved there. In the second part of this thesis the relaxation parameters of chemical exchange of selected sample at various temperatures were measured. Interpretations of experimental data (ionization, molecular clusters and isotopic equilibrium) was suggested.

Keywords: NMR, relaxation, water, dynamics, chemical exchange