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Evolution of Ultrasound transmission during the sol-gel transition

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The velocity of the ultrasound wave has been detected during the gelation process of the aqueous gelatin solution. We observe monotonic decrease of the ultrasound transmission in train of the gel network formation. In order to find the dependance of the ultrasound velocity on the number of the intermolecular bonds, responsible for gel formation, we have performed the simultaneous measurements of the optical activity evolution. The experiments have been performed in the gelatin gel and in the silica gel. We have described the process in terms of the percolation theory by power law, according to Landau theory of the second order phase transitions, and by fitting the theoretical results to the experimental curves we have found the appropriate critical exponents. We have also shown how the ultrasound velocity depends on the concentration of the gelling substance and on the temperature, in which the process of the sol-gel transition has been performed.