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N.M.R. STUDY OF FLUORINE MOBILITY IN THE FLUORITE-RELATED $Pb_{1-x}In_xF_{2+x}$ ($0 < x \leqslant 0.25$) SOLID SOLUTION

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C.W. and pulsed ^{19}F N.M.R. have been performed at 30 Mhz on six samples of tne fluorite-related solid solution $Pb_{1-x}In_xF_{2+x}$ (x = 0.025, 0.05, 0.12, 0.15, 0.20 and 0.25) in the temperature range 100°C-200°C. A broad line, characteristic of "static" fluorine atoms is observed under a temperature T_A. Between T_A and T_B thermal evolution of the signal exhibits a narrow line, growing at increasing temperature, at the expense of the broad one. Above T_B only this narrow line, characteristic of the mobile fluorine atoms, subsists. Spin-lattice relaxation time T_1 has been determined in the same temperature range, allowing the determination of the activation energy E_A of the local motions. The knowledge of T_A and T_B permits the determination of the long range conduction energy E_B, and the surfaces ratio of the broad and narrow lines at a given temperature leads to the distribution of activation energies between E_A and E_B. A continuous repartition for x = 0.12 and x = 0.20 but discrete values of energies for the others compositions are observed. The mobility of fluorine is discussed in relation to the structure of these phases.