**INFLUENCE OF PARAMAGNETIC OXYGEN ON NUCLEAR MAGNETIC SHIELDING OF SMALL MOLECULES STUDIED BY NMR SPECTROSCOPY IN THE GAS PHASE**

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**Abstract**

Gas-phase multinuclear NMR studies of nitrogen (N2), helium-3 (3He), carbon dioxide (CO2) and dinitrogen oxide (N2O) in two-component mixtures with pure nitrogen or synthetic air pressurized up to 300 bar were performed. It was found that the magnetic shielding of all the isolated molecules are in good agreement with recent results of *ab initio* calculations. The binary molecular interactions with oxygen molecules usually contribute to magnetic shielding three orders of magnitude larger than the appropriate interactions with nitrogen molecules. The three body collisions become observable by NMR for pressure higher than 100 bar and their virial coefficients can be practically assigned to the interaction between one solute molecule and a pair of O2 molecules.