

NMR spectroscopy is one of widely used instrumental analysis techniques in chemistry, physics, medicine and structural biology. Popularity of this method is related to their universality and ability to solving simple and complicated structural problems in 3 basis states of matter: gases, liquids and solids. It is worth emphasizing that with this technique it is possible to analyze even complex molecules such as proteins and their complexes with atomic precision. Liquid state NMR is most common and routinely used is organic chemistry. On the other hand solid state NMR spectroscopy is considered as complicated methods requires huge experience and large amount of materials to studies. However during last 15 years extremely large progress in solid state NMR have been done. It is connected with design of new generation of probeheads enabling to spin samples with frequencies as high as 60-150 kHz and 200kHz in near future. When spinning speed increase it is necessary to decrease of diameter of the used rotors, and so on amount of materials is strongly decreased. The main goal of presented project is design of new methods of solid state NMR spectroscopy to studies structure of pharmaceutical compounds and materials used in energy harvesting system. Proposed techniques will allow to looking for metallic center of mentioned materials and interatomic distance determination.