CHAPTER FOUR

^{1}H NMR Spectroscopy and MR Imaging with Hyperpolarised Substances

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Abstract

Despite their wide applicability in natural sciences, NMR and MRI still suffer from their inherently low sensitivity. This can be overcome by hyperpolarisation techniques, such as parahydrogen-induced polarisation and dynamic nuclear polarisation. Here, we focus on the generation of ^{1}H-hyperpolarised substances with both methods. We especially address the severe lifetime issue of the accomplished ^{1}H hyperpolarisation by demonstrating the production of hyperpolarised liquids in a continuous flow fashion and the storage of hyperpolarisation in slowly relaxing singlet states. Another problem of

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