



Exploration of New Tritium Labelling Methods

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A great deal of elegant chemistry is available for hydride transfer reactions, and could be adapted for tritium labelling. Nevertheless, most high level tritiation reactions still involve either hydrogenation (alkene or alkyne precursor) or catalytic dehalogenation. In the last decade we have endeavoured to propose and popularize alternative labelling techniques and reagents, including: i) the synthesis of new precursors for the production of methyl iodide;^{1a} ii) the synthesis of methylene diiodide;^{1b} iii) the production and use of T₂O, and solvents made from it, eg. CH₃COOT, CF₃COOT;^{1c} iv) high specific activity hydride reagents, eg. LiAlT₄,^{2a,b} LiEt₃BT,^{2a,b} (Buⁿ)₃SnT,^{2c} ZrCp₂CIT,^{3a} LiT,^{3b} Li(OCH₃)₃BT,^{3b} Ph₂SiT₂,^{3c} BT₃-THF,^{4a} Li/Na/KBT₄,^{4b,c,v} reduction with diimide;^{5a} vi) use of T₂O in special reactions such as the Shapiro reaction^{5b} and Brook rearrangement;^{5c} and vii) developments of a new acetylation reagent.⁶ We have also initiated and continued a number of innovative applications of tritium NMR spectroscopy.

Many of these projects have grown out of User or Collaborator requirements at the NTLF. We regard this stimulus to develop and refine both tritiation and NMR techniques as healthy and challenging.

References

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