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## Contents

### 1. Radiochemical synthesis and characterization of $^{99m}\text{Tc}$ complex of **12**.

#### Figure Captions

- Figure 1. LFP of **2** in  $\text{CH}_3\text{CN}$  containing  $\text{HNEt}_2$ . The transient absorption spectrum was taken 1.4  $\mu\text{s}$  after the laser pulse over a 200 ns window at ambient temperature.
- Figure 2.. LFP of **2** in  $\text{CH}_3\text{OH}$ . The transient absorption spectrum was taken 1.4  $\mu\text{s}$  after the laser pulse over a 200 ns window at ambient temperature.
- Figure 3.. LFP of **2** in  $\text{CH}_2\text{Cl}_2$  at  $-32^\circ\text{C}$ . The transient absorption spectrum was recorded 1.4  $\mu\text{s}$  after the laser pulse over a 600 ns window at  $-32^\circ\text{C}$
- Figure 4. A double reciprocal treatment of the ylide produced by LFP of **2** in 1:1  $\text{CH}_2\text{Cl}_2/\text{C}_6\text{H}_{12}$  at ambient temperature.
- Figure 5. Thin layer chromatography (TLC) of  $\text{TcO}_4^-$  before complexation in (a) acetone (b) ethyl acetate and (c) saline.
- Figure 6. TLC of  $^{99m}\text{Tc}$ -complex of **12** in (a) acetone and (b) saline.
- Figure 7. Electrophoresis diagram of  $\text{TcO}_4^-$  and  $^{99m}\text{Tc}$ -complex of **12**.

A solution of ligand **12** in methanol (1 mg/mL) was slowly added to 0.1 mL of 0.9% aqueous saline containing 10mCi (370 MBq) of  $\text{TcO}_4^-$  which was obtained from a commercial  $^{99}\text{Mo}/^{99\text{m}}\text{Tc}$  radionuclide generator (Mallinckrodt Nuclear). The mixture was added with 2 mL of 0.1 N HCl and heated at 80°C for 30 to 45 Minutes. The complex yield of Tc-chelate was determined periodically using paper chromatography and instant thin layer chromatography-silica gel (ITLC-SG) using acetone and saline as eluting solvents. Technetium complex moves in acetone to top, while in saline it stays at the bottom (Fig. 6). This chromatographic behavior is in contrast with the starting material  $\text{TcO}_4^-$  which moves in saline to top. The radiochemical purity (RCP) was further enhanced by extracting the complex into  $\text{CHCl}_3$  (to remove the unreacted pertechnetate) repeatedly and checked its chromatographic behavior for purity.













