Figure S1: $^1$H NMR spectra of PCEMA (bottom) and PIEMA (top) showing the shift in the chloroalkyl peak at 3.73 to the iodoalkyl peak at 3.33.

Figure S2: Synthesis of RAPTA-C in MeOH and CDCl$_3$. The reaction in CDCl$_3$ produced two products that were not identified.
Figure S3: IBu-RAPTA-C synthesised via Route 2 at 25°C in DMSO-d6 was subsequently heated to 60°C and monitored over time. Multiple side-products were observed.

Figure S4: Overlaid HMBC(\(^1\text{H} - \text{\textsuperscript{13}C}\)) & HSQC(\(^1\text{H} - \text{\textsuperscript{13}C}\)) NMR Spectrum of Butyl Iodide + PTA in DMSO-d6 at 25°C. Both the \(^1\text{H}\) and \(^{13}\text{C}\) spectra are external projections.
Figure S5: Overlaid HMBC(1H-13C) & HSQC(1H-13C) NMR Spectrum of Butylated PTA + RuCl₃(p-cymene) Dimer in DMSO-d₆ at 25°C. Both the ¹H and ¹³C spectra are external projections.
Figure S6: Initial PTA at 180.9 (bottom) shifted to Alkylated IBu-PTA at 214.13 (top).
Figure S7: Initial RAPTA-C at 465 (top) shifted to Alkylated lBu-RAPTA-C at 497 (bottom).