A Brief Summary Of Stew's Work:

I) Polymerization of PIB with allyl end-group.

A) Cumyl chloride was prepared by hydrochlorination of α–methyl-styrene. The product was characterized using $^1$H-NMR which showed that the reaction was essentially quantitative.

B) The conditions for the polymerization were as follows: Cumyl Chloride/ $TiCl_4$ / IB / dimethylacetamide / $C_6H_{14}$ / $CH_3Cl$ / -80°C. A one-pot functionalization was carried out after polymerization using allyltrimethylsilane.

C) According to GPC Mn = 9,333 g/mole and the PDI = 1.06. $^1$H-NMR showed that allyl functionalization was essentially quantitative.

II) Hydrosylilation of PIB with allyl end-group

A) Two grams of the above polymer (after thorough characterization and purification) were hydrosylilated to PIB with triethoxysilyl end-group. $^1$H-NMR indicated that this reaction was also close to 100% conversion. One gram of this hydrosylilated material was purified and then reacted alone in THF in the presence of an acid catalyst ($HCL/H_2O$). GPC indicated that a new material with a Mn = 54,427 g/mole and PDI = 1.07 had been produced. However GPC also indicated that 80% of the starting arms were unreacted. Light scattering was also carried out on this sample and gave essentially the same Mn (around 54,000 g/mole). The other gram of hydrosylilated material was reduced to PIB with silyl end-group for $^1$H-NMR characterization. This was done as a second check to make sure hydrosylilation had been 100% complete, but results were unsatisfactory due to impurities.

III) New work

A) About 90% of the material from my first star synthesis reaction was redissolved into THF and allowed to reflux in the presence of higher acid catalyst concentration. This material will be analyzed by GPC and light scattering to see if further condensation occurred.

B) Also, I have been running another hydrosylilation reaction so that I will have more arm material for new star synthesis. After purification/characterization of the formed arm material I will plan to carry out condensation in higher boiling point solvents and at increasing arm concentrations. Increasing both of these factors should increase the percent yield and maybe the number of arms per star molecule.