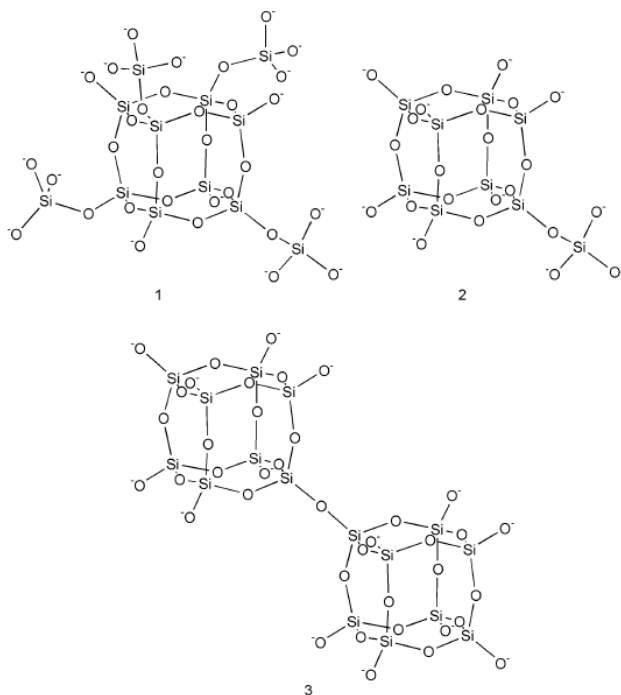


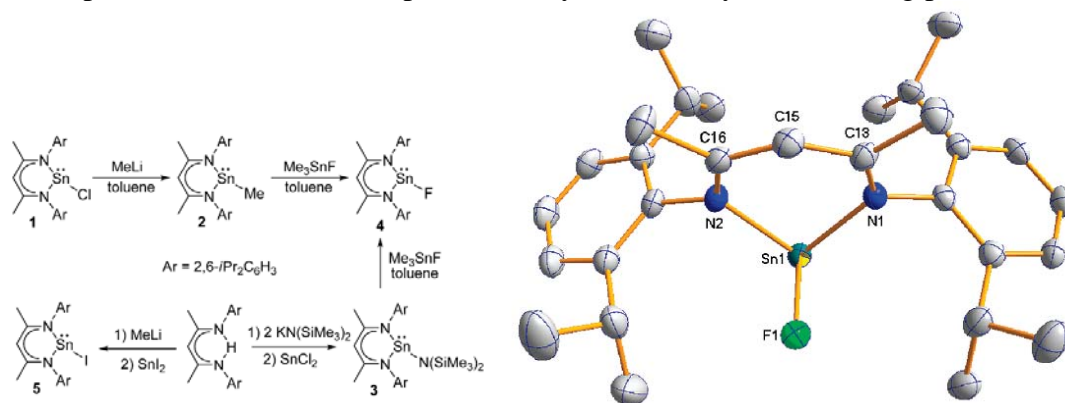
HW 2	Multinuclear NMR	Name:	
Points:	C6800	Date:	
Max. 100 points	Spring 2015	Version A	

1. (25 pts) Predict the number and relative intensities of the signals in the ^{29}Si NMR spectra of molecules **1–3**. Mark chemically different Si atoms with different colors. Give the symmetry point groups (Si-O-Si is linear in **3**, consider both conformations).



Molec.	Signal intensities	P.G.
1		
2		
3 staggered		
3 eclipsed		

2. (20 pts) The tin fluoride complex **4** was synthesized by the following procedure:

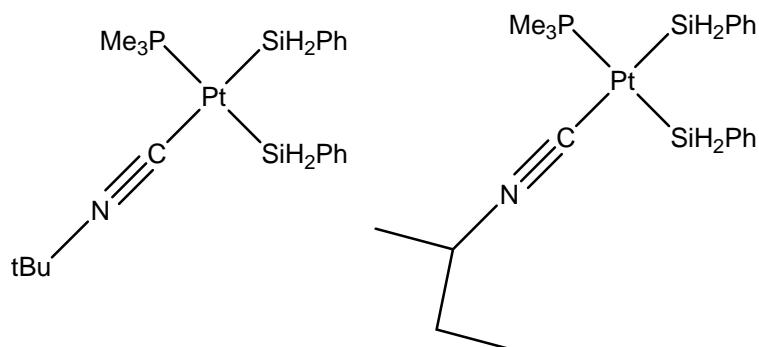


- Draw clearly all symmetry elements present in the complex **4**.
- Give the symmetry point group of the complex **4**.
- Are there any geminal groups? Assign them as **Homo-**, **Enantio-**, or **Diastereotopic**.
- How many resonances (signals) do you expect in the ^1H , ^{13}C , ^{119}Sn , and ^{19}F NMR spectra.

3. (18 pts) Consider the following compounds:

a) Are there any geminal groups in these molecules? Assign them as **Homo-**, **Enantio-**, or **Diastereotopic**.

b) How many signals do you expect in the ^1H NMR spectrum in the Si-H region?

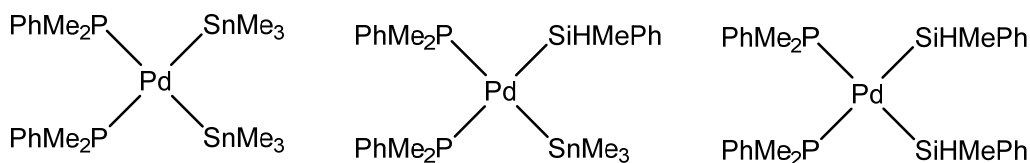


4. (31 pts) Consider the following complexes (also R/S diastereomers):

a) Are there any geminal groups in these molecules? Assign them as **Homo-**, **Enantio-**, or **Diastereotopic**.

b) How many CH_3 signals do you expect in the ^1H NMR spectrum?

c) Give the symmetry point group of the complexes (consider R/S diastereomers).



5. (6 pts) How many signals do you expect in ^{19}F and ^{31}P NMR spectra of the following compound:

