**Organic Chemistry Ⅱ (Midterm Exam)**

1. How many signals would you expect each of the following molecules to have in its 1H spectrum? (10%)



1. Which combinations give the highest reactivity in the Diels-Alder reaction? (4%)



1. Predict the products of the following reaction. (6%)



1. Please classify the following compounds to be aromatic, antiaromatic or nonaromatic. (10%)



1. How might you convert 1,3,5,7-cyclononatetraene to an aromatic substance? (4%)
2. Identify each of the following groups as an activator or deactivator and as an *o,p*-director or *m*-director: (8%)

(a)  (b)  (c)  (d) 

1. How might you synthesize the following compounds from benzene? (16%)
2. *m*-Chloronitrobenzene
3. *m*-Chloroethylbenzene
4. 4-Chloro-1-nitro-2-propylbenzene
5. 3-Bromo-2-methylbenzenesulfonic acid
6. Predict the major products of the following reaction. (30%)



1. Propose the mechanism of the following reaction. (12%)

