CHEM40006: Reactivity at Carbon Centres - Aromatic Chemistry

WORKSHOP PROBLEMS

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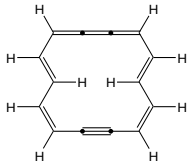
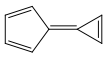
1. Compound **1** displays characteristic aromatic behaviour (*e.g.* strong 'shielding' of the two 'inside' protons in the ^{1}H NMR: δ -5.5 ppm).

a) How many π-electrons does this compound have?
b) Which of these participate in the aromatic system and why?



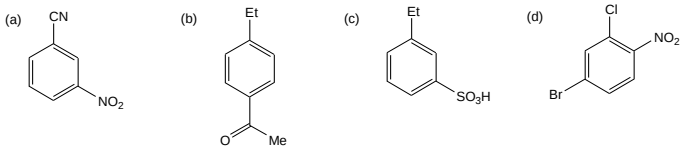
(**1**)

2. Why does compound **2** have a large dipole moment?



(**2**)

3. Propose reasonable syntheses of each of the following multiply substituted arenes from benzene. Indicate reagents and reaction conditions above arrows between isolated intermediates and justify/rationalise any site selectivity's invoked.



NB. Some of these compounds require multiple step procedures.

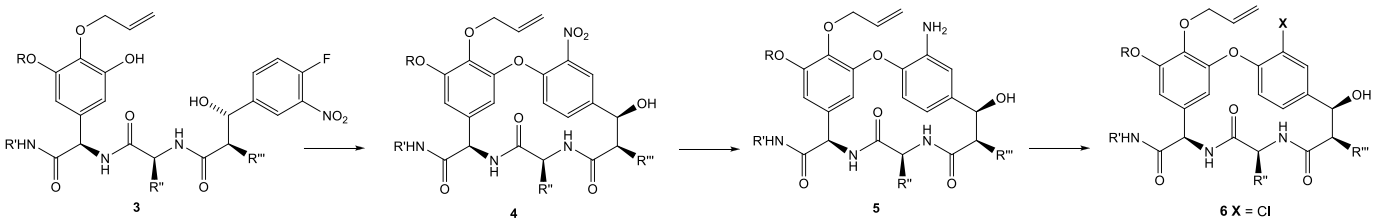
4. The sequence of synthetic transformations shown below are key steps in Dave Evans synthesis of the antibiotic vancomycin.

a) Suggest reagents and conditions for all the transformations. More than one step may be required for each transformation.

b) Write out a mechanism for the macrocyclisation reaction (**3** → **4**) and explain the importance of the fluoro and nitro groups in the success of this transformation.

c) Write out a mechanism for the conversion of aniline **5** into arylchloride **6**.

d) Suggest reagents which could be employed to prepare analogues of compound **6** (from aniline **5**) where X = F and X = CN.



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