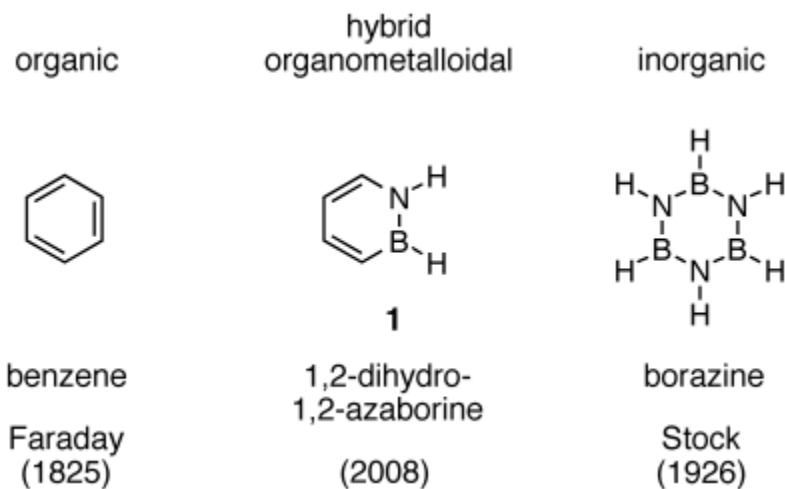


1. A recent article in the prestigious chemistry journal, *Angewandte Chemie International Edition* (2009, 48(5), 973-977), described the synthesis of compound **1**, 1,2-dihydro-1,2-azaborine. The researchers found compound **1** to have aromatic character with a stabilization energy of 21 kcal/mol, which is intermediate between the aromatic stabilization energy of benzene (34 kcal/mol) and borazine (10 kcal/mol).

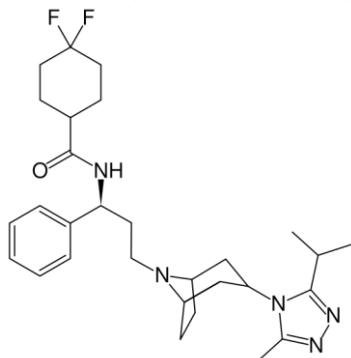


a) Using resonance structures, show how compound **1** and borazine can fit the classic definition of aromatic structures that we discussed in class. (6 pts.)

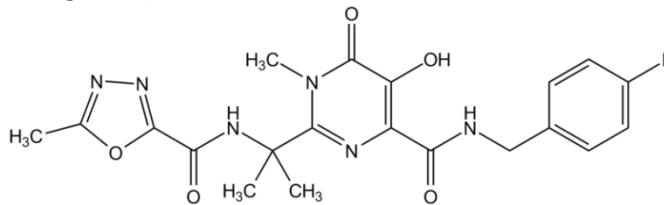
b) Propose an explanation for why the aromatic stabilization energy of compound **1** and borazine are lower. (2 pts.)

2. Shown below are four new drugs recently approved for various treatments. Circle all the aromatic structures in the compounds. Be sure to consider the effect of resonance forms! (4 pts.)

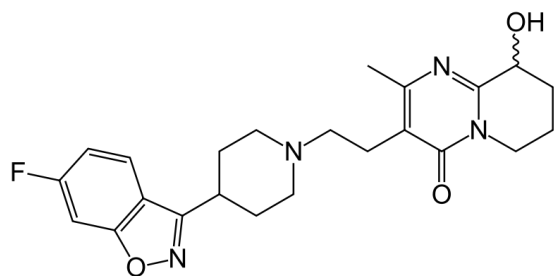
Maraviroc (anti-infective HIV)



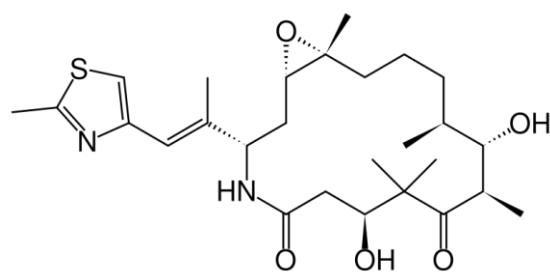
Raltegravir (anti-infective HIV)



Paliperidone (antipsychotic)



Ixabepilone (anticancer)



3. Draw the molecular orbital diagram for cyclopentadienyl anion and describe why it is a stable structure. (8 pts.)