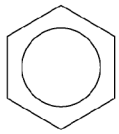
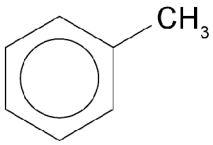
Aromatic Molecules Questions

1 Name the following aromatic molecules:

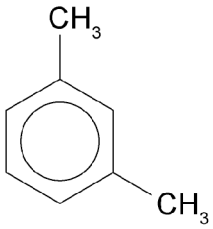
(a)



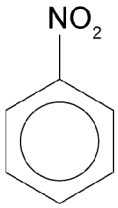
(b)



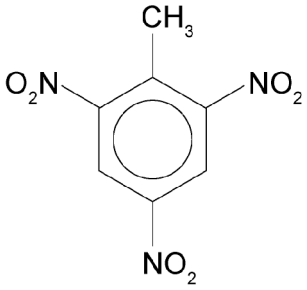
(c)



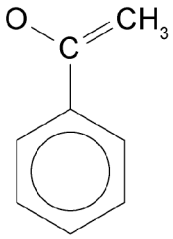
(d)



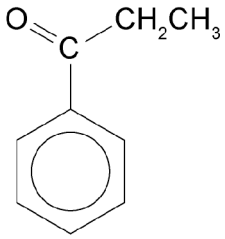
(e)



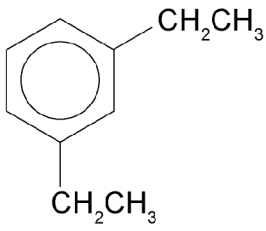
(f)



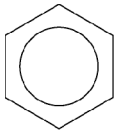
(g)



(h)



2 Write a short paragraph explaining why benzene has the structure shown below rather than that proposed by August Kekulé. Include at least three pieces of evidence in your answer.



3 This question is about the nitration of benzene. The reaction proceeds via an electrophilic substitution mechanism.

(a) Draw a full displayed formula for nitrobenzene.

(b) Explain what is meant by the term *nitrating mixture*.

(c) Write a formula for the electrophile which reacts initially with the benzene.

(d) Write a balanced equation showing how the electrophile is generated by the nitrating mixture.

(e) Write a mechanism for the reaction using curly arrows.

4 The acylation of benzene also occurs via an electrophilic substitution reaction. For example, phenylethanone can be made by the acylation of benzene. In the initial step of the reaction an electrophile is generated from ethanoyl chloride.

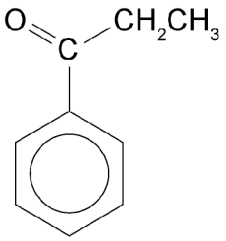
(a) Draw a full displayed formula for phenylethanone.

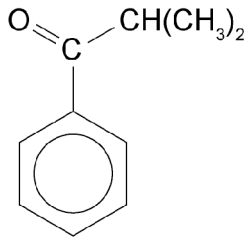
(b) Name the catalyst used in this reaction.

(c) Write a balanced equation for the formation of the electrophile from the reaction of ethanoyl chloride and the catalyst.

(d) Write a full mechanism for the reaction using curly arrows.

5 Write balanced equations for the formation of the following molecules from benzene.

(a) 

(b) 

(c)