1982 D

(a) Draw the Lewis electron-dot structures for CO32-, CO2 and CO, including resonance structures where appropriate.

(b) Which of the three species has the shortest C-O bond length? Explain the reason for your answer.

(c) Account for the fact that the carbon-oxygen bond length in CO32– is greater than the carbon-oxygen bond length in CO2.

1989 D

CF4 XeF4 ClF3

1. Draw a Lewis electron-dot structure for each of the molecules above and identify the shape of each.

1990 D

Use simple structure and bonding models to account for each of the following:

(a) The bond length between the two carbon atoms is shorter in C2H4 than in C2H6.

(b) All the bond lengths in SO3 are identical and are shorter than a sulfur-oxygen single bond.

1992 D

NO2 NO2- NO2+

Nitrogen is the central atom in each of the species given above.

1. Draw the Lewis electron-dot structure for each of the three species.

2004 Question 7

Use appropriate chemical principles to account for each of the following observations. In each part, your response must include specific information about both substances.

1. The shape of the ICl4- ion is square planar, whereas the shape of the BF4- ion is tetrahedral.

Answer the following questions that relate to chemical bonding.

(a) In the boxes provided, draw the complete Lewis structure (electron-dot diagram) for each of the three molecules represented below.

CF4 PF5 SF4