

## 1 Classifying Chemical Species

1. Identify the bonding present in the following species. See Table 8 for values of  $\chi$ .

- [1] (a) Osmium ( $Z = 76$ ) (a) METALLIC
- [1] (b) BrCl (b) COVALENT
- [1] (c)  $O_3(g)$  (c) COVALENT
- [1] (d) Between P and O in  $HPO_3^{2-}$  (d) COVALENT
- [1] (e) MgO (e) IONIC
- [1] (f) Ar (f) N/A IT'S JUST AN ATOM
- [1] (g)  $(NH_4)_2O$  COVALENT BETWEEN N-H  
(g) IONIC BETWEEN  $NH_4^+$  AND  $O^{2-}$
- [1] 2. (a) State and explain the bonding expected between boron and fluorine in  $BF_3(g)$ .

... DIFFERENCE IN ELECTRONEGATIVITY =  $4.0 - 2.0 = 2.0$  .....  
 ... BECAUSE  $2.0 > 1.8$  (THRESHOLD OF CONSIDERING AS IONIC),  $BF_3$  SHOULD BE IONIC .....

- (b) If you have prior knowledge about this kind of bonding, you should find the result surprising. What is inconsistent with your prior knowledge?

... IONIC COMPOUNDS TEND TO BE SOLIDS AT ROOM TEMPERATURE, .....  
 ... BUT BORON TRIFLUORIDE IS A **GAS**. .....