Worksheet 2.2

Explanation of properties

NAME: **CLASS:**

INTRODUCTION

Many substances exhibit a range of properties that can be explained in terms of the bonding between their constituent particles.

No.	Question	Answer
1	Which of the following compounds would have the higher melting point: NaBr or HBr? Explain your reasoning.	
2	**a** Explain the difference between the phrases 'aqueous solution of sodium chloride' and 'liquid (molten) sodium chloride'. **b** Compare the electrical conductivity of these two 'states' of sodium chloride.	
3	Graphite and diamond are both allotropes of carbon, yet when they are rubbed against a piece of frosted glass, diamond will scratch the glass yet graphite will only leave a black mark (that can be removed easily). Explain these differences.	
4	Potassium is a soft metal with a melting point of just 63°C, and fluorine is a gas at room temperature, yet potassium fluoride is a hard crystalline solid of melting point 858°C. Explain why KF has a much higher melting point than either of its constituent elements.	
5	Explain why brass, a mixture of Cu and Zn, is a malleable solid yet copper sulfate is a brittle	

	solid.	
6	Both white phosphorus (P_4) and bismuth (Bi) are in group 15 in the periodic table yet their electrical conductivities are 10^{-15} MS m^{-1} and 0.84 MS m^{-1}, respectively. Propose a reason for why there is a large difference in their conductivities.	
7	The three compounds silicon dioxide, sodium carbonate and water all have oxygen atoms covalently bonded to one or two atoms. However, the melting points of these compounds, 1713°C, 851°C and 0°C respectively, differ vastly. Explain why.	
8	List the charge carriers when an electric current is passed through the following substances: **a** solid copper **b** liquid mercury **c** molten potassium nitrate **d** hydrochloric acid **e** sodium nitrate solution **f** graphite **g** solid steel	