Name _____ Date _____ Period _____

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Properties of Ionic Compounds

Chemistry

Use a periodic table. Use the word banks, sentence frames and finished rows where they are given.
Every property of an ionic compound comes from strong attractions between + and − ions locked in a lattice.

1. For each pair, write the compound with the higher melting point and the reason. The first row is done for you.

Pair	Higher melting point	Reason (charges first, then size)
KF or BaO	BaO	2+ and 2− attract more strongly than 1+ and 1−
CsBr or SrS		
KCl or KI		

2. Decide whether each sample conducts electricity. The first row is done for you.

Sample	Conducts?	Reason (can the ions move?)
solid $CaCl_2$	No	ions locked in the lattice
melted $CaCl_2$		
$CaCl_2$ dissolved in water		
sugar ($C_{12}H_{22}O_{11}$) dissolved in water		

3. A student tested three unknown white or gray solids.

Solid	Melting point	Shiny?	Conducts as a solid?	Conducts dissolved in water?
X	80 °C	no	no	no
Y	801 °C	no	no	yes
Z	1085 °C	yes	yes	does not dissolve

(a) Which solid is most likely ionic? Give two pieces of evidence. (b) Which solid is most likely a metal? Give two pieces of evidence.

4. $CaCl_2$ dissolves in water. Which end of a water molecule faces Ca^{2+}, and which end faces Cl^{-}? Explain.
Word bank: oxygen end, hydrogen end, slightly −, slightly +, opposite charges attract

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5. Write the equation for each compound dissolving in water. The first row is done for you.

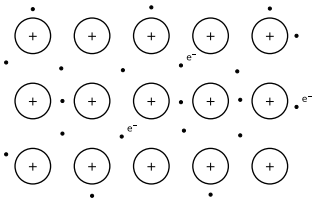
Compound	**Dissociation equation (with states)**
LiBr	$LiBr(s) \rightarrow Li^{+}(aq) + Br^{-}(aq)$
$MgCl_2$	
Na_2S	

6. (a) Explain why an ionic crystal shatters when it is hit hard.

Sentence frame: *A hit shifts a layer of ions, so _____ end up side by side. They _____, so the crystal _____.*

(b) Explain why almost all ionic compounds are solids at room temperature.

7. The diagram shows a model of a metal. Use it to complete the table that compares an ionic solid with a metal. The first row is started for you.



	Ionic solid (NaCl)	**Metal (Cu)**
Particles	Na^{+} and Cl^{-} ions	
Held together by		
Solid conducts? Why?		
Hit with a hammer		
Shiny (luster)?		

8. A copper wire bends when it is hammered, but a salt crystal shatters. Explain the difference.

Word bank: layers slide, sea of electrons, like charges, repel, malleable, brittle

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