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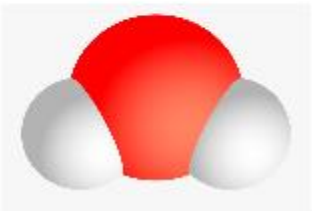
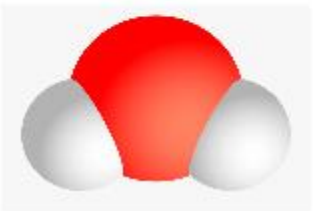
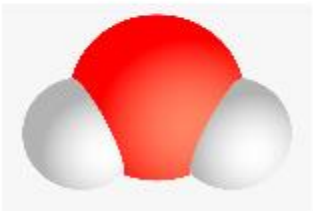
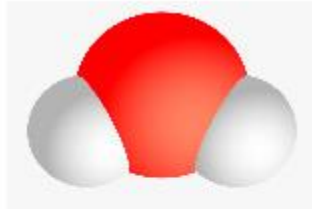
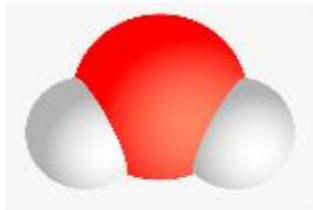
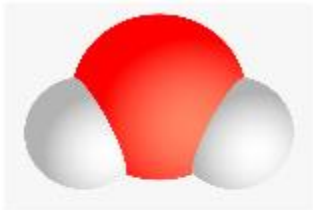
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Lattice Energy and Ionic Compounds Activity:

Part A

Cut out the ions and the water molecules on the given page.

- Arrange the ionic compounds as a solid on your desk.
- Then arrange the ionic compounds and the water molecules showing an aqueous solution with the dissolved ionic solid.

Question 1: Which of the three ionic compounds would have the strongest ion-to-dipole attractions between the ions and the water molecules? Explain your answer.

Question 2: Which of the three ionic compounds would have the weakest ion-to-dipole attractions between the ions and the water molecules? Explain your answer.

Part 2

Data Set A

	Lattice energy (kJ/mole)
LiCl	-830
NaCl	-770
KCl	-700
RbCl	-680
CsCl	-660

Data Set B

	Lattice energy (kJ/mole)
NaCl	-770
MgCl ₂	-2530
Na ₂ O	-2570
MgO	-3930
Al ₂ O ₃	-15270

1. Consider the data presented above:

a. Which set of data could be analyzed to show the effect atomic size has on lattice energy? Explain your choice.

b. Which set of data could be analyzed to show the effect ion charge has on lattice energy? Explain your choice.

2. Refer to the data presented above.

a. As the ions in the solid lattice get bigger, thus making the bond length longer, what happens to the lattice energy of the solid? Note: Ignore the sign on the lattice energy. The sign is indicating that energy is released. You are interested in the magnitude of the lattice energy.

b. Describe how your answer in part a relates to the law of Coulombic attraction between charged particles?

3. Refer to the data presented above.

a. When the ions in the solid lattice have higher charges, what happens to the lattice energy of the solid?

b. Describe how your answer in part a relates to the law of Coulombic attraction between charged particles.

4. Which compound in each row would have the larger lattice energy? Be prepared to justify your reasoning.

MgO	MgCl ₂
MgCl ₂	MgF ₂
MgO	CaO
AlCl ₃	Al ₂ O ₃

5. Match the ionic compounds below to their lattice energy.

Compound	Lattice Energy kJ/mole
LiF	-2800
Li ₂ O	-2240
KF	-1030
KBr	-820
K ₂ O	-680