

Practice Exam Water **ANSWERS**

1. Water is **A. polar molecule with polar covalent bonds between H & O**
2. Iodine is a solid and bromine is a liquid at STP because of **C. dispersion forces**
3. It takes more energy to turn water into steam than ice into water because:  
**D. making steam requires breaking all of the hydrogen bonds**
4. You melt a 9.000 gram hunk of ice at 273K in your hand without temperature change. You used how many joules to melt this ice this? **D. 3006 joules**
5. Surface tension in water can be broken by **C. surfactants**
6. How many grams of NaCl can dissolve into 50 mL of water at 90°C? **B. 20 g**
7. When CaCl<sub>2</sub> dissolves in water **B. it is an ionic compound, so it is an electrolyte**
8. Which compounds show a decrease in solubility as temperature rises in an aqueous solution?  
**C. SO<sub>2</sub> & HCl**
9. Oil and vinegar do not mix. That's because **B. they are immiscible**
10. A solution that contains more solute than theoretically possible is called:  
**D. super-saturated**
11. Why does CH<sub>4</sub> have a much lower boiling point (-164°C) than NH<sub>3</sub> (-33°C)?  
**B. ammonia has many hydrogen bonds**
12. Like dissolves like would account for: **D. all three of the above**
13. Skip this one
14. When you add salt to water... **A. boiling point increases, freezing point decreases**
15. CaCl<sub>2</sub> is used rather than NaCl to melt ice because  
**A. CaCl<sub>2</sub> ionizes into three moles of particles, NaCl into only 2 moles**
16. Hydrogen bonding will:  
A. cause a lower vapor pressure in water compared to rubbing alcohol  
B. cause a high boiling point in water compared to C<sub>2</sub>H<sub>6</sub>.(ethanol)  
C. cause surface tension to be great enough for bugs to stand on water  
**D. all of the above**
17. The amount of joules it will take to melt 60.05 grams of ice at zero centigrade to water at the same temperature is **D. 20040 joules (4SF)**
18. The energy required to heat 100.0 grams of water from 30.5°C to 47.2°C is **C. 6980 J**

19. Gases generally have lower solubility as solution temperature increases. This might explain why people tend to burp after gulping cold soda. Why does this happen?  
**B. cold soda holds more CO<sub>2</sub> in solution than the soda that warms in your belly, you heat it up and the carbon dioxide comes out of solution in your stomach**
20. Water freezes at STP at **C. 273K**
21. Water has a low vapor pressure due to its many hydrogen bonds. What is low vapor pressure?  
**B. water doesn't evaporate much under glass in a sealed system**
22. What is the reason that ice floats on water?  
**A. hydrogen bonds force water molecules into a 6 sided hexagon shape with space in the center**
23. When you dissolve ammonium nitrate into water  
**B. the compound dissociates and the reaction is endothermic**
24. 522 grams of water has... **C. 29.0 moles and a freezing point of 273K**
25. If you have a saturated solution of ammonia at 10°C of 1500.0 mL, and you heat it to a temperature of 90°C, and you are told that this solution cannot be supersaturated, how many grams of ammonia will come out of solution by the time it reaches the final temperature? **C. 900 g**

How to do this last problem... use the ratio to determine how many grams of ammonia fit into a 1500 mL solution at 10°C (1050 g). Then figure how many grams of ammonia fit into the 1500 mL solution at the hotter 90°C (150 g). Subtract the starting ammonia mass from the amount that could remain in solution at the hot temperature (1050 - 150 g = 900 grams falls out of solution).