

Episode 12 - Water

1. What is the annual rate of consumption of water per person? What percent of this is for agricultural purposes?
2. What are the main uses of water in industry?
3. How does the mass of a water molecule compare to common gases like nitrogen, oxygen, and carbon dioxide?
4. What is meant by a polar molecule?
5. What is hydrogen bonding?
6. What are some properties of water that are due to hydrogen bonding?
7. What is unusual about the density of ice compared to the density of water?
8. Briefly describe the dissolving process.
9. What generalization may be made about whether or not one material will dissolve in another?
10. Why is there controversy about the amount of various chemicals that may be found in a sample of water?

Answer Key

1. What is the annual rate of consumption of water per person? What percent of this is for agricultural purposes?

Two million gallons; 80%

2. What are the main uses of water in industry?

Transfer of heat, solvent, reactant

3. How does the mass of a water molecule compare to common gases like nitrogen, oxygen, and carbon dioxide?

It is less - the others are all gases at room temperature

4. What is meant by a polar molecule?

A molecule with unequal sharing of electrons and areas of different charge density.

5. What is hydrogen bonding?

The attraction of hydrogen in one molecule to the oxygen in another.

6. What are some properties of water that are due to hydrogen bonding?

It is a liquid at room temperature, it has a high boiling point, it is a good solvent.

7. What is unusual about the density of ice compared to the density of water?

The solid is less dense than the liquid.

8. Briefly describe the dissolving process.

The partially negative pulls out positive ions from the crystal while the partially positive hydrogens pull out the negative ions.

9. What generalization may be made about whether or not one material will dissolve in another?

Likes dissolve likes.

10. Why is there controversy about the amount of various chemicals that may be found in a sample of water?

Small amounts of these chemicals may be present naturally. We can measure extremely small levels of chemicals. Should these become the permissible levels for the chemicals, i.e. just because we can detect it, is it bad?