1. A 1.28 mol sample of Ar gas is confined in a 31.5 liter container at 26.5 C.

If 1.28 mol of He gas is added holding the volume and temperature constant, the average kinetic energy of the total system will:

1. decrease
2. remain the same
3. increase
4. not enough information to answer the question

---

2. In the situation above, the **pressure will increase** because:

1. As the number of molecule-wall collisions increases, the force per collision increases.
2. With more molecules per unit volume, the molecules hit the walls of the container more often.
3. With more molecules in the container, the molecules have higher average speeds.
4. With higher average speeds, on average the molecules hit the walls of the container with more force.
5. None of the Above

---

3. A 0.900 mol sample of H2 gas is confined in a 22.4 liter container at 29.8 C.

If 0.900 mol of N_2 is substituted for the 0.900 mol of H_2, holding the volume and temperature constant, the **average kinetic energy** will:

1. increase
2. decrease
3. remain the same
4. not enough information to answer the question

---

4. A 1.96 mol sample of CO_2 gas is confined in a 49.1 liter container at 32.3 C. If the temperature of the gas sample is increased to 55.0 C, holding the volume constant, the **pressure will increase** because:

Choose all that apply.

1. With higher average speeds, on average the molecules hit the walls of the container with more force.
2. With lower average speeds, the molecules hit the walls of the container less often.
3. As the average speed increases, the number of molecule-wall collisions decreases.
4. None of the Above

---

5. Mixing Na_2CO_3 + $CuCl_2$ yields the following **net ionic equation**:

1. Na_2CO_3 (s) + $CuCl_2$ (s) == $CuCO_3$ (s) +

$2NaCl\ (s)$

2. $Na^{+}\ (aq) + CO_3^{2-}\ (aq) + Cu^{2+}\ (aq) + Cl^{-}\ (aq) == CuCO_3\ (s) + Na^{+}\ (aq) + Cl^{-}\ (aq)$
3. $2Na^{+}\ (aq) + CO_3^{2-}\ (aq) + Cu^{2+}\ (aq) + 2Cl^{-}\ (aq) == CuCO_3\ (s) + 2Na^{+}\ (aq) + 2Cl^{-}\ (aq)$
4. $CO_3^{2-}\ (aq) + Cu^{2+}\ (aq) == CuCO_3\ (s)$

---

6. A **weak acid** is a compound which when placed in water:

1. leads to production of some OH^{-}
2. dissociates completely to produce H^{+}
3. dissociates slightly to produce H^{+}
4. is insoluble

---

7. When acids and bases are **mixed** together they:

1. explode
2. precipitate
3. generate water
4. don't mix well

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8. Reactions in water which **produce gases** tend to:

1. be unfavorable
2. be favorable
3. be exothermic

4. be rare

Why??

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9. The redox state of **Fe** in FeCO3 is:

1. -1
2. 0
3. +1
4. +2
5. +3

---

10. In the reaction: Fe_2O_3 (s) + 2Al (s) == 2 Fe (l) + Al_2O_3 (s), the **oxidizing agent** is:

1. Fe_2O_3
2. Fe
3. Al_2O_3
4. Fe_2O_3 and Al_2O_3
5. Al_2O_3
6. none of the above

---

11. Which solution has the highest concentration of H^+:

1. pH = 3
2. pH = 5
3. pH = 7
4. pH = 9

5. pH = 12

---

12. Which set below has examples of (only) **kinetic energy**:

1. thermal energy, mechanical energy, electric energy
2. thermal energy, bond energy, electrostatic energy
3. gravitational energy, bond energy, electrostatic energy
4. gravitational energy, thermal energy, electric energy

---

13. Which set below has examples of (only) **potential energy**:

1. thermal energy, mechanical energy, electric energy
2. thermal energy, bond energy, electrostatic energy
3. gravitational energy, bond energy, electrostatic energy
4. gravitational energy, thermal energy, electric energy

---

14. In an **exothermic** process:

1. work is performed on the surroundings
2. heat is transferred to the surroundings

3. work is performed on the system
4. heat is transferred to the system

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15. **Specific heat capacity** refers to:

1. the heat given off per mole of reaction
2. the heat given off per gram of reaction
3. the heat required to raise the temperature of one gram of a substance by 1 K
4. the heat required to raise the temperature of one mole of a substance by 1K

---

16. The term **state** refers to:

1. the system being studied - not the surroundings
2. liquid, gas, or solid
3. animal, vegetable, or mineral
4. initial conditions
5. final conditions

17. The **heat of fusion** is:

1. the energy required to fuse 1 mole of two molecules together
2. the energy required to convert, at its melting point, 1 mole of a substance in the liquid state into the solid state
3. the energy required to convert, at its melting point, 1 mole of a substance in the solid state

into the liquid state

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18. Change in **internal energy** is best described as:

1. ΔH
2. q
3. w
4. q+w
5. ΔG

---

19. A positive value of ΔE means that:

1. heat is tranferred to the surroundings
2. heat is transfered to the system
3. energy in the form of heat and/or work is transferred to the surroundings
4. energy in the form of heat and/or work is transferred to the system

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20. When one **pushes down** on a bicycle pump connected to a tire at 80 psi:

1. Work is performed on the pump/tire system
2. Work is performed by the pump/tire system
3. No net work is performed