**Year 8 Chemical Science 2022 - State and Changes of Matter Test**

**Section 1: Multiple Choice Questions – *Read all the answers and choose the BEST one.***

1. **What change would need to be made to reduce the movement of particles in a substance?**
2. Remove heat energy from the substance
3. Remove magnetic energy from the substance
4. Add heat energy to the substance
5. Add electrical energy to the substance
6. **When conducting an experiment, which of the following things would suggest to you that a physical change is happening?**
7. Light is produced
8. Permanent colour change
9. Dissolving occurs
10. Gas is produced
11. **If the chemical properties of a substance remain unchanged and the appearance or shape of a substance changes, it is called a:**
12. Chemical changes
13. Physical change
14. Both a chemical and physical change
15. Neither a physical nor a chemical change
16. **Two solutions are added together, and the new solution becomes hot. This tells you that:**
17. a gas is being produced.
18. the solutions are not soluble.
19. the physical properties are the same.
20. a chemical reaction is taking place
21. **Identify which of the following is a physical change.**
22. sugar caramelising
23. toast bread
24. a glass breaking
25. burning a match
26. **Select the true statement about chemical and physical changes.**
27. The combustion of candle wax is an example of a chemical changes.
28. Physical changes involve new substances with new physical and chemical properties being formed.
29. Physical changes are quite difficult to reverse.
30. The condensation of water vapour is an example of a chemical change.
31. **The recycling of aluminium can be considered a series of physical changes as shown by the flow diagram below.**

**Which stages of the aluminium recycling process would be considered a change of state?**

**Diagram

Description automatically generated**

1. I and II
2. II and III
3. III and IV
4. only III
5. **In which state of matter are particles packed tightly together in fixed positions?**
6. gas
7. solid
8. liquid
9. compound
10. **In which of the following pairs of characteristics of an element are the temperatures the same?**
11. boiling point and freezing point
12. condensation point and melting point
13. freezing point and condensation point
14. melting point and freezing point
15. **An alloy is a mixture of metal with \_\_\_\_\_**
16. another metal or other non-metal material
17. a non-metal material only
18. another metal only
19. None of the answers is correct.
20. **What is it called when liquid becomes a gas only at the surface of the liquid?**
21. Melting
22. Evaporation
23. Boiling
24. Distillation
25. Diagram

    Description automatically generated**The graph below shows how the temperature of a substance changed as it was heated. Which segment of the graph indicates that the substance was undergoing a change of state?**
26. A
27. B
28. C
29. All of the above
30. **As a solid object is heated, its particles:**
31. attract each other more, causing contraction.
32. vibrate less rapidly and cause it to contract.
33. vibrate more rapidly and cause it to expand.
34. shrink in size so the gaps between them increase.
35. **Define melting point.**
36. Melting point is the temperature at which a liquid changes to a gas.
37. Melting point is the temperature at which a solid changes to a gas.
38. Melting point is the temperature at which a liquid changes to a solid.
39. Melting point is the temperature at which a solid changes to a liquid.
40. **The melting point of water is:**
41. 0°C
42. 100°C
43. 32°C
44. 60°C
45. **Which one of the following statements about the particle theory of matter is incorrect?**
46. There are empty spaces between the particles.
47. All matter is made up of tiny particles.
48. The particles can move when they are heated.
49. All substances are made of the same particles.
50. **Which of the following statements about ice melting is true?**
51. Energy flows from the ice to its surroundings
52. Water molecules move from their fixed position
53. Water molecules lose energy
54. The temperature of the ice increases as it melts
55. **Identify why gases are easily compressed.**
56. the particles can diffuse.
57. there is pressure between particles squashing them together.
58. there is great energy between the particles allowing them to change.
59. there is a lot of space between the particles.
60. **When a gas is stored inside a closed container, the gas exerts a pressure on the sides of the container. The amount of pressure is determined by:**
    1. how frequently the gas particles hit the sides of the container
    2. how fast the particles are moving when they hit the side of the container.

Diagram

Description automatically generated

**If the volume of the container is halved, you would expect:**

1. the pressure to increase, because the particles have less room so will hit the side of the container more frequently.
2. the pressure to increase, because the particles will travel faster.
3. the pressure to decrease, because the particles have less room will hit the side of the container less frequently.
4. the pressure to decrease, because the particles will travel slower
5. **Expansion results in an:**
6. increased volume, decreased density
7. increased density, decreased volume.
8. Increased volume, decreased volume.
9. Decreased volume, decreased density.
10. **When metals are heated they expand because the particles that make up the metal crystal lattice vibrate more. This means that metal wires will increase in length as they are heated.  However, different metals expand at different rates. The graph below shows how much one metre of aluminium wire increases in length with an increase in temperature. In this graph, the increase in length is measured in millimetres.**

Chart, line chart

Description automatically generated

**From this graph, determine how much a 10 m long aluminium wire would increase in length if the temperature was increased by 10°C**

1. 0.025 mm
2. 0.23 mm
3. 0.23cm
4. 2.3cm
5. **Below -78.5°C carbon dioxide is a solid. Above this temperature it is a gas. Determine which process carbon dioxide would undergo as the temperature is raised from -80°C to -75°C.**
6. evaporation
7. sublimation
8. melting
9. condensation
10. **The table below shows the melting points and boiling points of substances A to D.**

|  |  |  |
| --- | --- | --- |
| 1. **Substance** | 1. **Melting point** | 1. **Boiling point** |
| 1. i | 1. -127 oC | 1. -33 oC |
| 1. ii | 1. 119 oC | 1. 446 oC |
| 1. iii | 1. -39 oC | 1. 35 oC |
| 1. iv | 1. 63 oC | 1. 760 oC |

**Which substance is a gas at 25oC?**

1. i
2. ii
3. iii
4. iv
5. **To form a solution a \_\_\_\_\_\_\_\_\_\_\_\_ is dissolved in a \_\_\_\_\_\_\_\_\_\_**
6. Solvent, solute
7. Solution, solvent
8. Solute, solvent
9. Mixture, solute

1. **Jonathon poured a tablespoon of sand and a tablespoon of sugar into 200mL of water and stirred. The sugar seemed to disappear while the sand remained. Identify the solvent and solute in this mixture.**
   1. Solute = sand, solvent = water
   2. solute = water, solvent = sugar
   3. solute = sugar, solvent = sand
   4. solute = sugar, solvent = water

**- End of Multi Choice Section –**

|  |  |
| --- | --- |
| Mount Lawley Senior High School - Wikipedia | **Mount Lawley Senior High School** |
| **Year 8 2022 – Chemical Science – States of Matter and Changes Test** |
| Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Class: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

***Section A: Multiple Choice – Please shade the best suited answer in PEN* 25 marks**

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D
6. A B C D
7. A B C D
8. A B C D
9. A B C D
10. A B C D
11. A B C D
12. A B C D
13. A B C D
14. A B C D
15. A B C D
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17. A B C D
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19. A B C D
20. A B C D
21. A B C D
22. A B C D

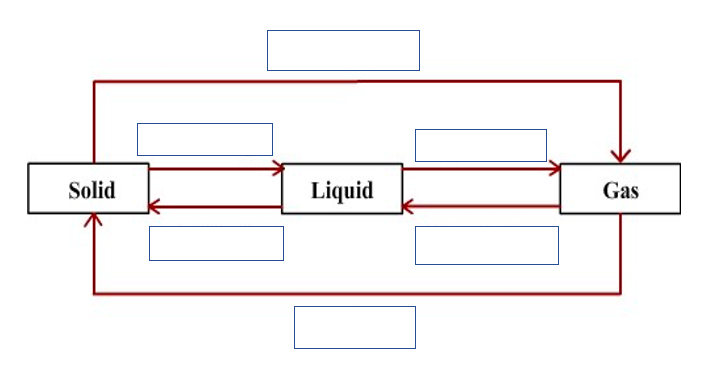
**Multiple Choice: \_\_\_\_\_\_\_\_ /25**

**Short Answer: \_\_\_\_\_\_\_\_ / 25**

**TOTAL: \_\_\_\_\_\_\_\_ / 50**

1. A B C D
2. A B C D
3. A B C D

**Section 2: Short Answer Questions Total: 25 Marks**

**1. Complete the diagram with the correct names of the changes in state.**  **(3 Marks)**

**Sublimation**

**Evaporation/Vaporisation**

**Melting / Liquifying**

**Freezing / Solidifying**

**Condensation**

**Deposition**

**2. Complete the table below about the properties of Solids, Liquids and Gases (3 marks)**

Descriptive answers can be accepted too

|  |  |  |  |
| --- | --- | --- | --- |
| **State of Matter** | **Volume** | **Shape** | **Molecular Attraction** |
| **Solid** | Fixed | Fixed | Strong/High |
| **Liquid** | Fixed | Variable | Medium |
| **Gas** | Variable | Variable | Weak/Low |

**3. You mix a solution of Copper Sulfate (CuSO4) and a solution of Barium Chloride (BaCl2). A white solid powder of Barium Sulfate (BaSO4) forms in a left over solution of Copper Chloride (CuCl2).**

**a) State if this is a chemical change or a physical change:** (1 mark)

chemical

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**b) Justify your answer to part a):**  (1 mark)

A white powder BaSO4 has formed from two solutions OR new substance formed OR term use: Precipitate has formed.

would have been

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**c) Explain what a precipitate is:**  (1 mark)

a solid (insoluble) substance formed – ½ mk

when two clear solutions react- ½ mk

\*\*LIQUIDS accepted\*\*

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**4. The seeds of the Cycad tree have a high nutrient content but are covered with a fleshy covering that contains toxic (poisonous) chemicals. The Djirbalngan people of Queensland know this and use processes to prepare the seeds to make food. (4 marks)**

*After the seeds are roasted to change the toxic chemicals, they are crushed. The crushed pieces are placed in a woven basket in running water for 12-24 hours to dissolve and wash away any unwanted chemicals. The material is then baked into a bread like substance.*

1. **List the steps used in preparing seeds to make food***(there are extra lines if you need more space) .*

**B. Identify each step as a *physical or chemical* change above.**

**Part A** **Part B**

**½ mk for correct step and ½ mk for correct change**

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**roasting** seeds to change chemicals chemical

**crushing** seeds physical

**dissolving** unwanted chemicals physical

**baking** into bread chemical

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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**5. Alice and Joanne placed a piece of metal in a test tube of liquid and made five observations about the reaction they witnessed, which they recorded in the table below:**

chemical

**(a). State whether Alice and Joanne observed a physical or a chemical change? (1 mark)**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

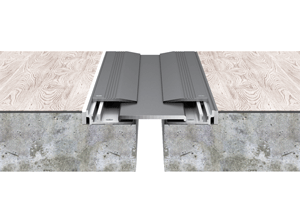
|  |  |  |
| --- | --- | --- |
| OBSERVATION | RESULTS | |
| START | FINISH |
| Temperature | 23C | 45C |
| Colour | Colourless | Colourless |
| Liquid | Clear | Clear |
| Piece of metal | Can be seen | Can no longer be seen |
| Air above test tube | No smell | Strong smell |

**(b). Identify and explain two observations in the table that support your answer to A? (2 marks)**

* Change in temp
* Smell has been released

Metal has dissolved does not get mark as dissolving is a physical change

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**6. Bridges and footpaths contain expansion joints as shown.  
Use your understanding of the particle model (including energy) to   
discuss the importance of expansion joints on a hot summer’s day.**   **(4 marks)**

**Gaining energy = 1 mark**

**Particles Faster and spread out = 1 mark**

**Volume/BRIDGE expands = 1 mark**

**Reason is so bridge does buckle/get holes = 1 mark**

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**Table

Description automatically generated7. The table below lists materials that are gases at standard laboratory temperature (25oC).**

**a) Name the material with the lowest freezing point.**

**helium**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1 mark)**

**b) Name the material with the highest freezing point.**

**chlorine**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1 mark)**

**NO half marks for being swapped around.**

**c) Liquid Krypton has a boiling temperature of –153°C. Explain what would happen to krypton particles, as the temperature is increased from –160°C to –150°C. (3 marks)**

**Gaining energy/speeding up/spreading out = 1 mark for any or all**

**Solid to gas = 1 mark (solid 🡪 liquid 🡪 gas also accepted)**

**1 mark for either of the following:**

**- Sublimation (terminology) - Give individual state temperatures**

**w**

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