**INVESTIGATING COMMON CHEMICALS USING UNIVERSAL INDICATOR**

**Skills: AI**

**AIM:** To identify common (household) chemicals as an acid or base using universal indicator

**APPARATUS and MATERIALS:**

* Smaller beakers labelled with each chemical
* Droppers for each chemical
* Universal indicator paper strips
* Chart for universal indicator paper
* Household chemicals – lemon juice, baking soda, toothpaste
* Washing soda (NaCO3), salt, coca cola, distilled water, limewater

**DIAGRAM:**



Diagram showing colours of universal indicator paper with various pH values.

**INSTRUCTIONS:**

1. Measure out 5ml of each chemical and place in labelled beakers.
2. Using a dropper add one or two drops of solution onto the universal indicator paper.
3. Note the colour that it becomes and record it in the table.
4. Decide if that chemical is an acid, an alkali or neutral in pH.

*Rewrite your method into past tense in the space below or on a separate page.*

**METHOD**:

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**RESULTS:**

Table showing \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |
| --- | --- | --- | --- |
| **Name of Substance** | **Chemical name** | **Indicator Colour** | **pH number** |
|
| **Lemon juice**  | Citric acid |  |  |
| **Baking soda** | Sodium hydrogen-carbonate |  |  |
| **Toothpaste** | Mixture |  |  |
| **Washing soda** | Sodium carbonate |  |  |
| **Salt** | Sodium chloride |  |  |
| **Coca Cola** | Mixture |  |  |
| **Distilled water** | Hydrogen oxide |  |  |
| **Limewater** | Calcium hydroxide |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

**DISCUSSION:** *Write your responses in full sentences on a separate page –* ***use paragraphs.***

1. Define the terms – acid and base or alkali.
2. Neutral solutions have what pH value?
3. Which solutions tested were acids and which were alkaline or bases?
4. Why does lemonade/ lime juice have a sharp taste?
5. Are acids and bases useful in our everyday lives? How?
6. Draw a pH scale like the one below and fill it in.

|  |  |  |  |
| --- | --- | --- | --- |
|  | pH value | Colour | Examples |
| Strong acids | 0 | Deep red |  |
| 1 | Red |  |
| 2 |  |  |
|  | 3 |  |  |
| Weak acid | 4 | Orange |  |
| 5 | yellow |  |
| Slightly acidic | 6 |  |  |
| Neutral | 7 | Green |  |
| Slightly alkaline | 8 | Dark green |  |
| Weak alkali | 9 |  |  |
| 10 | Light blue |  |
|  | 11 |  |  |
| Strong alkali | 12 | Violet – purple |  |
| 13 |  |  |
| 14 |  |  |

**CONCLUSION:** *State what you found out in this experiment?*

**MARKSCHEME - ANALYSIS AND INTERPRETATION (AI)**

|  |  |
| --- | --- |
| **Criteria (AI)** | **Marks** |
| 1. What is an acid?
 | 2 |
| 1. What is a base or alkali?
 | 2 |
| 1. How can an acid be neutralized?
 | 2 |
| 1. How are acids and bases useful in our everyday lives?
 | 2 |
| 1. Conclusion
 | 2 |
| **TOTAL** | **10** |