

Question 20 (4 marks)

- (a) Identify ONE common household base.

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vinegar, acetic acid CH_3COOH

- (b) A student used indicators to determine whether three colourless solutions were acidic or basic. The indicators used are shown in the table.

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Indicator	Colour change	pH range
Methyl orange	red to yellow	3.2–4.4
Methyl red	red to yellow	4.8–6.0
Thymol blue	yellow to blue	8.0–9.6
Alizarin	red to purple	11.0–12.4

Samples of each solution were tested with the indicators. The colours of the resulting solutions are shown in the table.

Indicator added	Colour of solution A	Colour of solution B	Colour of solution C
Methyl orange	yellow	yellow	yellow
Methyl red	yellow	yellow	yellow
Thymol blue	blue	blue	yellow
Alizarin	purple	red	red

The student concluded that each of the three solutions tested was basic. Assess the validity of this conclusion.

Solutions A and B are definitely basic as they were both blue when tested against Thymol blue. However the validity of the results of solution C must be questioned. In order to obtain a more accurate result for solution C it should be tested with a more appropriate indicator such as universal indicator.