

Question 20 (4 marks)

- (a) Identify ONE common household base.

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NH_3 Ammonia cleaners/detergents.

- (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 >4.4	yellow >4.4	yellow >4.4
Methyl red	yellow >6.0	yellow >6.0	yellow >4.8
Thymol blue	blue >9.6	blue >9.6	yellow <8.0
Alizarin	purple >12.4	red <11.0	red

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

Solutions A and B are certainly bases. A tested ~~with~~ a pH >12.4 and B has a pH >9.6 but <11.0 . ~~From~~ Therefore they are both bases. The solution C although maybe acidic, neutral or basic as the pH falls between 4.8 and 8.0 so perhaps another test should be taken with universal indicator.