

Question 20 (4 marks)

(a) Identify ONE common household base.

1

Oven cleaner

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

3

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 acidic	yellow	yellow
Methyl red	yellow acidic	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.

not validity as it is ^{for} only correct of solution A and B. ~~the~~
 The conclusion is ~~not valid~~. From the result, because all 3 solutions show yellow with Methyl orange and Methyl red indicating that the pH is ^{above or equal} ~~above~~ 4.4 and ^{above or equal} ~~above~~ 6. Then when Thymol blue was used, the results indicated the solution A and B are ^{around} ~~over~~ the pH of 9.6 and over while solution C is ^{within 8} ~~between~~ as the colour did not change. When Alizarine was added, the colour change of the ~~3~~ solutions indicated that solution A is around the pH of 12.4 while B and C ~~is around about~~ is about 9.6–11.0 and because solution C did not change in both indicator of a pH range of base, thus it is not a base.