

Question 20 (4 marks)

- (a) Identify ONE common household base. 1

..... Detergent

- (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	Acid
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	Basic

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

Basic
Basic
Basic
6.0 - 11.0

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

..... It is not valid as color of solution C does not indicate indefinitely that it is basic. Results show that it turned yellow in Thymol blue indicating its pH is not as high as 9.6 and so the Alizarin indicator shows as not reliable but it does demonstrate to us and shows us also that solution C can not be basic as it is not purple. Solution A and B had valid because their results in Methyl Orange, Methyl Red & Thymol Blue shows they have surpassed the pH. ranges clearly indicating they are basic solutions.