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extract	20	0	20.7		colourless	
	20	0	20.5			
	20	0	20.5			
	20	0	20.5			
Purple allamanda flower extract	20	0	20.6	20.56	Orange to yellow	20.56 ± 0.089
	20	0	20.4			
	20	0	20.6			
	20	0	20.6			
	20	0	20.6			
African marigold flower extract	20	0	21.9	21.86	Orange to red	21.86 ± 0.089
	20	0	21.9			
	20	0	21.7			
	20	0	21.9			
	20	0	21.9			
Chrysanthemum flower extract	20	0	22.5	22.52	Green to yellow	22.52 ± 0.045
	20	0	22.5			
	20	0	22.5			
	20	0	22.5			
	20	0	22.6			

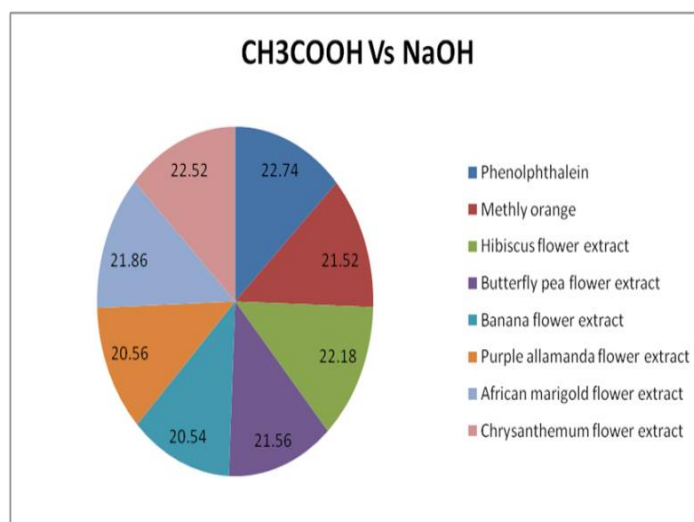


Figure 2: Weak acid vs. strong base.

Table 3: Titration of CH₃COOH vs. NH₄OH using aqueous extract of hibiscus, butterfly pea, banana flower, purple allamanda, African marigold and chrysanthemum.

Indicator	Volume of acid (ml)	Burette reading (ml)		Volume of titrant, mean value(ml)	Colour change	Mean \pm std. dev. of the titer value (ml)
		Initial	Final			
Phenolphthalein	20	0	-	12.22	No proper change	12.22 ± 0.045
	20	0	-			
	20	0	-			
	20	0	-			
	20	0	-			
Methyl orange	20	0	12.2	12.22	Yellow to red	12.22 ± 0.045
	20	0	12.2			
	20	0	12.3			
	20	0	12.2			
	20	0	12.2			
Hibiscus flower extract	20	0	9.1	9.12	Pink to yellow	9.12 ± 0.045
	20	0	9.1			
	20	0	9.2			
	20	0	9.1			
	20	0	9.1			
Butterfly pea flower extract	20	0	9.5	9.5	Violet to blue	9.5 ± 0.000
	20	0	9.5			
	20	0	9.5			
	20	0	9.5			
	20	0	9.5			
Banana flower extract	20	0	9	8.92	Yellow to Colourless	8.92 ± 0.045
	20	0	8.9			
	20	0	8.9			
	20	0	8.9			
	20	0	8.9			
Purple allamanda flower extract	20	0	10.1	10.18	Pink to colourless	10.18 ± 0.045
	20	0	10.2			
	20	0	10.2			
	20	0	10.2			
	20	0	10.2			
African marigold flower extract	20	0	10.2	10.36	Orange to light green	10.36 ± 0.089
	20	0	10.4			

	20	0	10.4			
	20	0	10.4			
	20	0	10.4			
Chrysanthemum flower extract	20	0	13.5	13.48	Green to colourles	13.48 ± 0.045
	20	0	13.5			
	20	0	13.5			
	20	0	13.5			
	20	0	13.4			

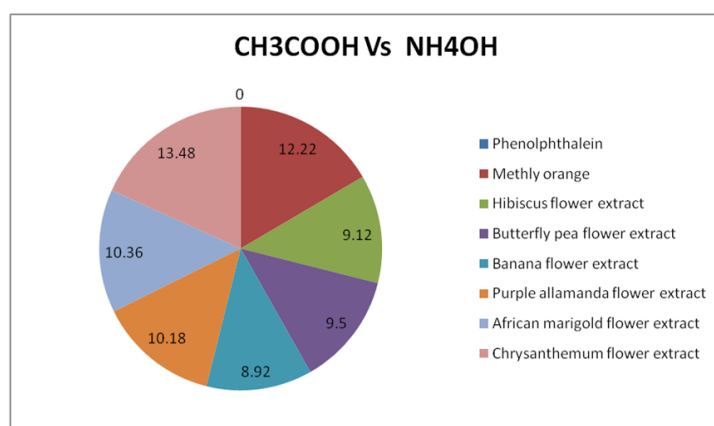


Figure 3: Weak acid vs. weak base.

CONCLUSION

The natural indicators extracted from the flower petals was found to be a potential substitute for methyl orange or phenolphthalein for titrations of strong acid versus weak base and strong acid versus strong base. Hence, the flower petal extract as a natural indicator is found to be a very useful, readily available, non-hazardous, economical, simple to prepare and accurate for the acid-base titrations.

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