X. NOTE ON THE USE OF SINALBIN AS AN INDICATOR.

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SINALBIN, the glucoside of White Mustard (*Sinapis alba*, Boiss.), develops an intense yellow colour with alkalis, which disappears on adding an excess of acid [Will, 1872]. This property renders it a useful indicator. It is prepared [Will, 1872] by extracting 400 g. of the finely ground seeds in a large Soxhlet apparatus with carbon disulphide until the extract is free from the yellow essential oil. The residue (200 g.) is dried in air and boiled for 30 minutes with 500 cc. of 95 % alcohol to inactivate enzymes; the alcoholic liquid is filtered hot, and, on cooling (preferably in ice-water), the glucoside crystallises out. A further yield may be obtained by a second extraction with hot alcohol. The crystals are filtered off, washed with a little ether, and twice recrystallised from hot 98 % alcohol; yield 4–5 g. The stock indicator solution is of 0.5 % strength; solutions in dilute (30 %) alcohol keep indefinitely, while aqueous solutions are liable to attack by moulds. About 1–2 cc. of this solution are added to every 100 cc. of liquid under examination.

Properties.

p_H range: 6.2 (colourless)–8.4 (yellow)

Indicator exponent (p_K): 8.2 at 18°

Salt error:	KCl normality	< 0.38	0.38	0.46	0.54
	Correction	Nil	+0.02	+0.06	+0.15
Protein error:	Protein	2 % caseinogen (Hammarsten)	2 % natural egg-white	4 % ox-blood serum	
	Correction	– 0.09	+0.03	+0.04	

The p_H values were determined electrometrically with the quinhydrone electrode and Cole's Direct Reading Potentiometer (Cambridge Instrument Co.): Sørensen's phosphate buffers were used throughout.

Sensitivity.

Sinalbin gives a sharp end-point with strong acids and bases down to dilutions of $N/100$; with weak acids and bases it may be used down to $N/10$ concentration. For comparison with phenolphthalein, the factor of an approximately $N/10$ solution of barium hydroxide was determined volumetrically

against weighed amounts of pure acid, and the figure checked by precipitating the barium as sulphate. Titrations in each case were carried to the first appearance of the indicator colour.

Standardisation of Ba(OH)₂.

						Mean normality
Gravimetric	...	...	...	...	...	0.860
Volumetric						
(a) With sinalbin:	Against salicylic acid					0.862
	Against succinic acid					0.862
(b) With phenolphthalein:	Against salicylic acid					0.856
	Against succinic acid					0.858

Sinalbin is affected by carbon dioxide in the cold, but may be used for the estimation of carbonates in boiling solution: since, however, it is decomposed by hot alkalis the carbonate must be run into a known excess of hot acid, and not *vice versa*. Its sensitivity and p_H range should make it useful for the micro-titration of some alkaloids, particularly quinine. It is suitable for use with ammonia.

SUMMARY.

Sinalbin, the glucoside of White Mustard (*Sinapis alba*), may be used as an indicator. The p_H range is 6.2 (colourless)–8.4 (yellow): the salt and protein errors are small. It is suitable for the titration of weak acids and bases, and may be used with ammonia.

I wish to express my thanks to Mr S. W. Cole for his advice and encouragement.

REFERENCE.

Will (1872). *J. Pharm. Chim.* 327.