CLI. A RAPID METHOD FOR THE ESTIMATION OF TOTAL IRON IN BLOOD.

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Of the current methods for the determination of total iron in blood, none appears to be entirely quantitative [Burmester, 1934]. The method here described however has been found reasonably accurate and is well suited to routine analysis where numerous samples must be examined in a relatively short time.

The blood is digested with a sulphuric-nitric acid mixture and the Fe estimated by a modification of Hill's [1931] $\alpha\alpha'$ -dipyridyl method. The detailed procedure is as follows. Pipette 0.5 ml. of oxalated blood into a pyrex test-tube (12×2 cm.). Add 1.5 ml. of Fe-free concentrated H_2SO_4 and 0.5 ml. of redistilled HNO_3 . Heat cautiously over a micro-burner, with continuous shaking, until nitrous fumes cease to be evolved. Cool slightly, add 2 drops HNO_3 and heat as before, repeating until a clear solution is obtained and the nitrous fumes are completely expelled. Cool and make up to 25 ml. with distilled water. Mix 1 ml. of this solution with 1 ml. of $\alpha\alpha'$ -dipyridyl reagent (0.0012 M $\alpha\alpha'$ -dipyridyl in 5 N Fe-free ammonium acetate) in a 1 cm. tube of a Lovibond tintometer. Add $\text{Na}_2\text{S}_2\text{O}_4$ grain by grain with continuous shaking until the maximum colour is developed (only a trace is needed; a large excess would produce cloudy solutions). The intensity of the red colour is then almost directly proportional to the Fe content within the concentration limits observed (Fig. 1). The Fe content may therefore be determined either from the approximate relation: $\text{mg. Fe}/100 \text{ ml.} = 6.44$ (Lovibond red units), or from a graph constructed by treating a series of standard Fe solutions exactly as described above. Fig. 1 was obtained in this manner (except that the red colour was measured in a 1 cm. round cell of a Rosenheim-Schuster tintometer).

Fig. 1.

In Table I are presented the results of an analysis of oxalated sheep blood by the present method and by the usual thiocyanate procedure as described by Peters and Van Slyke [1932].

Table I.

mg. Fe per 100 ml. blood	
Present method	Thiocyanate method
43.5	45.5
42.0	41.5
40.5	42.0
35.0	35.0
33.5	33.5
27.5	27.0
26.0	26.5

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