

α, α' -Dipyridyl as a phenol-detecting reagent

Detecting reagents, originally developed for use with chromatography, are used frequently with little or no modification in thin-layer chromatography. Examples of these are the widely used reagents for detecting phenols, diazotized sulphanilic acid¹ and ferric ferricyanide (FF)². If, however, permanence of the chromatoplate is a requisite, then the FF detector is unsuitable since the unreacted reagents cannot be washed out from the water sensitive silica gel, and a blue background colour rapidly develops. Attempts to modify the FF reagent to eliminate this background colour resulted in a new phenol-detecting reagent applicable to both paper and thin-layer chromatography.

Based on the theory proposed by BROUMAND AND SMITH³ that ferric chloride in the presence of phenols forms a 1:1 complex, $\text{Fe}(\text{OAr})^{2+}$, it follows that colour tests sensitive to ferrous ion, such as reaction with potassium ferricyanide and α, α' -dipyridyl⁴, should also detect the ferric-phenol complex. In fact, a satisfactory detection of phenolics results on either papergrams or chromatoplates when sprayed with a freshly mixed solution of 0.5% (w/v) aqueous ferric chloride and 0.5% (w/v) methanolic α, α' -dipyridyl. This provided additional evidence of the presence of the $\text{Fe}(\text{OAr})^{2+}$ complex, and the validity of the explanation of the formation of the blue complex with potassium ferricyanide as outlined in a previous paper².

Wherever reaction between ferric chloride and phenolic hydroxyl had occurred, red spots characteristic of the ferrous- α, α' -dipyridyl were formed when a wide spectrum of simple and complex phenols was tested. Although full colour development required 30 min the ultimate sensitivity was the same as for the FF reagent, namely 1 γ , but with negligible background colour.

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