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Note**Titanium chromogenic reagent for phenolic compounds on thin-layer plates**

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A number of chromogenic reagents have been reported for the detection of phenolic compounds on thin-layer plates^{1,2}. In addition several specific reagents have been described for the detection of different naturally occurring phenolic compounds²⁻⁶. These include vanillin·HCl for catechins, *p*-toluenesulphonic acid for flavonoids, nitric acid for fully methylated phenolic compounds, Benedict's reagent for *o*-dihydroxy groups, an acidic solution of sodium tungstate followed by alkali treatment for *o*-dihydroxyphenolic compounds, antimony chloride and lead acetate for flavonoids and a solution of sodium cobaltinitrite for phenolics possessing a free hydroxyl position *ortho* to a phenolic hydroxyl group.

This paper describes the new chromogenic reagent (20% TiCl₄ in conc. HCl) for detecting phenolic compounds on thin-layer plates of silica gel G based on the reaction between titanium tetrachloride and phenols. This reaction has been utilized for the quantitative estimation of phenolic compounds⁷. Titanium tetrachloride also complexes with hydrogen peroxide and forms the basis for determining residual

TABLE I

COLOUR REACTIONS OF PHENOLIC COMPOUNDS WITH TITANIUM CHROMOGENIC REAGENT ON THIN-LAYER PLATES

<i>Compound</i>	<i>Colour</i>	<i>Compound</i>	<i>Colour</i>
Vanillic acid	Yellow	<i>ortho</i> -Dihydroxyphenolic compounds	
Ferulic acid	Yellow		
Naringenin	Yellow	Caffeic acid	Light brown
Phenol	—	Protocatechuic acid	Medium brown
<i>p</i> -Hydroxybenzoic acid	Light yellow	Pyrocatechol	Medium brown
<i>p</i> -Coumaric acid	Yellow	Rutin	Dark brown
Salicylic acid	Yellow	Chlorogenic acid	Dark brown
Syringic acid	Yellow	Quercetin	Dark brown
Resorcinol	Orange-yellow	Catechin	Medium brown
Phloroglucinol	Yellow		
3,5-Dimethoxy-4-hydroxycinnamic acid	Orange-yellow		

peroxide in milk⁸. The results summarized in Table I indicate that with the exception of phenol naturally occurring phenolic compounds can be readily detected with the titanium reagent. The colours which develop immediately, are reported at 4 μg concentrations with the orthodihydroxyphenolic compounds giving brown spots. The colour complex is stable for up to 4–6 h after which the spots tend to darken. It is evident that the titanium spray can specifically identify those phenolic compounds possessing orthodihydroxy groups on silica gel G plates.

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