

## NOTE

**Periodate Oxidation of *Acacia auriculiformis* Gum Polysaccharide**

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Periodate oxidation is the most important reaction in the structural determination of polysaccharides. It was done by using sodium metaperiodate as oxidant; results showed the consumption of 6.05 moles of periodate and liberation of 1.24 moles of formic acid per equivalent of gum.

*Acacia auriculiformis* plant<sup>1</sup> (Mimoseae) occurs in Himalayan region of Northern India. Periodate oxidation reaction is used in carbohydrate chemistry and also applicable in seed and gum polysaccharides. This reaction was first discovered by Malaprade<sup>2</sup>, and Fluey and Lange<sup>3</sup> have given a better method for more extensive use of periodic acid for oxidation of glycol. The glycol groups undergo cyclic ester formation with the oxidant and the reaction is considered to be dialdehyde type of oxidation<sup>4</sup>.

Gum polysaccharide (147 mg) was oxidised<sup>3</sup> with water (50 mL) and sodium metaperiodate (400 mg), then reaction mixture kept for 6 days at room temperature. After destroying the excess of sodium metaperiodate with ethylene glycol, the liberated formic acid was titrated by sodium hydroxide (0.01 N). Formic acid produced per equivalent of gum was found to be 1.24 moles after correction for titrable acidity of gum and the periodate consumption at this stage was 6.05 moles per equivalent of gum.

*Hydrolysis of periodate oxidised gum polysaccharide:* To a suspension of gum polysaccharide (137 mg) in water (50 mL) was added potassium chloride (3 g) and sodium metaperiodate (400 mg) in dark at room temperature; oxidation was withdrawn (0.5 mL) every 24 h; excess of periodate destroyed by ethylene glycol and filtered against NaOH (0.01 N). After the oxidation was complete (150 h), excess of periodate was destroyed by ethylene glycol and inorganic ions removed by dialysis. The dialyzed solution was acidified with H<sub>2</sub>SO<sub>4</sub> so as to make the strength of resulting solution 1 N and heated on water-bath (12 h). Hydrolysate was neutralised (BaCO<sub>3</sub>), filtered and concentrated to syrup. Paper chromatography of syrup indicated the presence of D-galactose using solvent system (v/v). *n*-butanol, ethanol, water (4 : 1 : 5 upper phase)<sup>5</sup> and *p*-anisidine phosphate<sup>6</sup> were used as spray reagents.

*Acacia auriculiformis* gum polysaccharide was oxidised with sodium metaperiodate. It yielded 1.24 moles of formic acid per equivalent of gum with concomitant consumption of 6.05 moles of periodate. The presence of (1→6)-β; (1→3)-β and (1→5)-α-type linkages is also confirmed by periodate oxidation results. A final decision regarding the detailed molecular structure of gum can only be made by further quantitative assessments of methylation and periodate oxidation results.

### REFERENCES

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