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# SHORT REPORT

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## AN ALKALI-SOLUBLE OIL PAINT BASED ON OIL FROM PARINARI FRUIT INDIGENOUS TO THAILAND

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### Summary

*A novel type of oil paints is formulated, based on fumaric acid-parinari oil varnish. The wet paint can be washed with dilute alkali or detergent. The parinari oil is obtained from a fruit indigenous to Thailand.*

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In the present world of pollution consciousness, products must be made with due attention paid to the safety of consumers. For the oil paints, cleaning up of cans and brushes is usually accomplished with kerosene or other volatile solvents. Danger from inhalation and absorption into the skin can possibly occur during the cleaning process. It is for this reason that we formulated a novel type of oil paints based on an alkali-soluble varnish. Such a varnish, by virtue of its solubility in alkalis, would enable the wet paint to be washed with dilute caustic soda or alkalis while the dry paint film remains insoluble upon complete polymerization. The paint thus has the advantage of less health hazard and easy cleaning with non-volatile, harmless solvents.

Many water-thinnable varnishes have been reported, but we wish to report an alkali-soluble oil paint based on fumaric acid-parinari oil varnish, the method of preparation of which has been described by one of us<sup>1</sup>. The varnish now finds use as a vehicle in a novel type of printing inks<sup>2</sup>.

The oil of *Parinari anamense* Hance is a drying oil obtained from the fruit of the tree indigenous to Thailand, Laos and Cambodia. It is similar to tung oil in

many respects, comprising a considerable proportion of eleostearic acid which confers to the oil a good drying property. On cooking with fumaric acid, an alkali-receptive varnish is formed analogous with tung oil<sup>3</sup>. The varnish can be used alone or in combination with conventional alkyd or phenolic varnishes along with other requisite ingredients to form an alkali-soluble paint.

The parinari-fumaric acid varnish affords paints with moderate fastness and fine finish. In view of the carboxyl groups introduced into the chain backbones of the oil by reaction with fumaric acid, fastness of the varnish to alkalis is poor. Its gloss is also inferior to that of paints made with alkyds or phenolics. However, we have found that combination with 10% phenolic varnishes affords a varnish with better alkali resistance. The paint made with the combined varnish was found to have an improved alkali resistance and gloss.

The accompanying formula is an example of alkali-soluble paints of moderate gloss, based on the mixed varnish.

Parinari-fumaric varnish <sup>1</sup> (10% fumaric acid)	100 g.
Phenolic varnish	10 g.
Titanium dioxide	134 g.
Calcium carbonate	67 g.
Magnesium silicate	33 g.
Solvent	100-130 g.
Phenyl mercuric acetate (fungicide)	3 g.
Drier	as required

The dry paint film has a good weathering resistance and fastness to chemical solvents with the exception of alkalis. The wet film can be cleaned with an aqueous solution comprising 1% caustic soda and 1% sulfonated castor oil, the latter acting as a dispersing agent.

The wet paint has the added advantage of easy cleaning with detergents, a fact which makes it practical for everyday usage. Owing to the dark color, however, the varnish is not suitable for making white paints without toning with a blue toner.

## References

1. Nitidandhaprabhas, Ovar (1977) *American Ink Maker*, September 1977, p. 39
2. Nitidandhaprabhas, Ovar (1979) *American Ink Maker*, May 1979, p. 36
3. Nitidandhaprabhas, Ovar (1978), *J. Chem. Educ.*, 55, 544

## บทคัดย่อ

ผู้เขียนได้เสนอสีน้ำมัน (สำหรับทาบ้าน) แบบใหม่ ซึ่งขณะยังไม่แห้งตัว สามารถชำระล้างได้ด้วยด่างหรือผงซักฟอก สีดังกล่าวนี้ ทำจากน้ำมันมะมือ ซึ่งได้ปรับปรุงคุณภาพให้ละลายในด่าง โดยให้น้ำมันทำปฏิกิริยากับ fumaric acid ต้นมะมือเป็นไม้ของประเทศไทยโดยเฉพาะ