

Absence of Chromates in Detergents in India Confirmed by Diphenyl Carbazide Spot Test

To the Editor:

Chromate is a significant occupational contact allergen. In the general population, chromium compounds induce allergic contact dermatitis, whereas they induce both irritant and allergic contact dermatitis in the industrial population. Industrial exposure is frequently observed among cement workers, paint makers, tannery workers, welders, and glass polishers. Domestic exposure includes exposure to detergents and bleaching agents, shaving creams and lotions, chrome-tanned leather articles (shoes), and match heads.^{1,2}

The reported frequency of allergy to chromate varies from 1.1% in California to 11.1% in India³ and Germany. European studies reveal that chromates are found in detergents. These phosphate-containing detergents contain chromium salts that may produce dermatitis in chrome-sensitive individuals.^{1,2}

This study was done to confirm the presence of chromate in detergents in the Indian market.

We collected 20 popular brands of detergents and subjected them to chromate diphenyl carbazide spot testing.¹ The brands of detergent tested were Ariel, Surf-Excel, Rin, Rin-Supreme, Wheel, Mr. White, Henko, Nirma, Tide, Active Power, Shashi, Ujala, and Rin-Advanced. Also, the dishwashing powders Sabena and Pril and a Vim dishwashing bar were tested. All tested negative for chromates. Construction cement was used as a control.

The chromate test was carried out as follows: 1 g of soap powder or a 1 g piece of a soap bar was dissolved in 3 mL of hot water in a test tube. This solution was acidified with 1 mL of dilute hydrochloric acid (1:5 dilution); then 1 mL of a 1% alcoholic solution of diphenyl carbazide was added. The development of a persistent red color denotes a positive test result that is specific for hexavalent chromium salts. The test is sensitive to 10 parts per million (ppm).¹ None of the tested samples showed a red color, whereas the

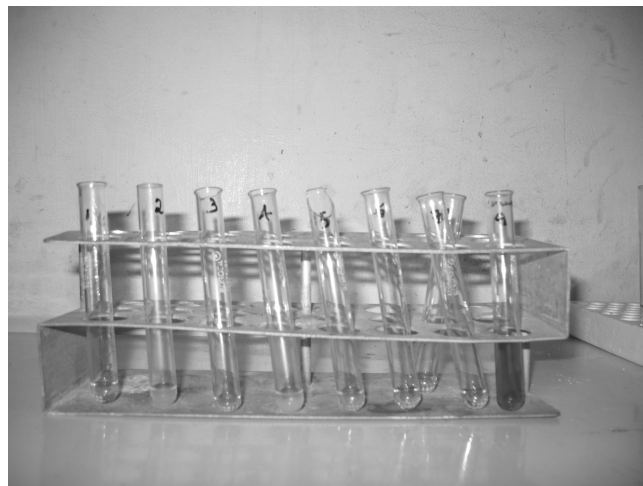


Figure 1. The colorless tested detergent samples show no reaction to diphenyl carbazide. The control (cement) sample shows a positive reaction (red color) to diphenyl carbazide.

construction cement used as a control showed a red color at the end of the test (Fig 1). This test can also be conducted with 2N sulfuric acid instead of dilute hydrochloric acid; a positive reaction is noted when a purple color appears.⁴

Reports differ greatly as to the significance of chromates in detergents as a cause of dermatitis. Historically, chromate at too high a level has been shown to cause dermatitis. Ingber and colleagues found the level of chromium in some detergents in Israel to be 100 ppm.⁵ Basketter and colleagues found the level of chromate in various laundry and handwashing detergents in Europe to be 0.6 to 1.1 ppm⁶; they stated that a chromate level of not more than 1 ppm in consumer products would be safer. In our study, the diphenyl carbazide test was negative for chromate with various detergents, which indicates that the level of chromates in these detergents is well below 10 ppm. Therefore, it seems that in India, as in most other locations in the world, where the presence of chromate content in detergents is tightly controlled, chromate is not an important cause of detergent-induced dermatitis.

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