

A rare nail polish allergen: phthalic anhydride, trimellitic anhydride and glycols copolymer

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The main allergen responsible for nail polish contact dermatitis is toluene sulfonamide formaldehyde resin (TSFR) (1). However, we observed 3 cases of allergic contact dermatitis from nail polishes due to an original compound phthalic anhydride/

trimellitic anhydride/glycols copolymer (PTGC). As this new allergen is not available from the allergens suppliers, only patch testing to the patient's nail polish(es) and the breakdown of the positive varnishes can show the responsibility of this particular allergen.

Case Reports

Case 1

A 20-year-old atopic woman presented with generalized eczema and major lichenification of lips and eyelids progressively worsening during the past 4 years. Recent patch testing with the standard International Contact Dermatitis Research Group (ICDRG) series (2) was negative.

Case 2

A 57-year-old woman had recurrent eyelid and neck dermatitis, with severe nail dystrophy. She underwent negative patch testing including standard series, TSFR and her own nail polishes that she was asked to bring along. The lesions persisted for several months, and she was referred again.

Case 3

A 53-year-old dentist assistant with a history of occupational contact dermatitis and asthma due to glutaraldehyde presented with head and neck eczema lasting for 3 months.

In the 3 patients, a further patch test session including *all* the nail polishes used (some had been forgotten at the first session by case 2) gave positive reaction(s) to a few polishes and a negative response to TSFR. Testing to separate constituents of the positive nail polishes identified PTGC (1% to 5% pet.) as the responsible allergen in the 3 patients. Subsequent patch testing to the 3 raw monomers, namely phthalic anhydride, trimellitic anhydride and glycols performed in 2 patients was negative.

All the patients were cured after avoidance of the identified allergen.

Comments

PTGC results from condensation of phthalic anhydride, trimellitic anhydride, ethylene glycol and neopentyl

glycol monomers (3, 4) (Fig. 1). Marketed under Polynex™ B-75 and Polynex™ B-100, PTGC has no CAS number. As this copolymer has been used in confection of nail polishes for many years, it seems that Allergic Contact Dermatitis (ACD) to PTGC is rare. The PTGC has been reported responsible for nail polish dermatitis in few patients (5, 6). All these patients had neck, eyelid, lips or finger dermatitis lasting from 3 months to 1 year. Allergic dermatitis from nail polishes can produce severe lichenification of eyelids, lips and/or neck or even diffuse dermatitis. In the 3 patients, this new allergen remained unknown because patch testing was performed only with TSFR but not with the patient's nail polishes. These cases underline the necessity of testing personal allergens and new testing when dermatitis worsens without any explanation. As there is no cross-reactivity between TSFR and PTGC, an alternative option for the patient is the use of a nail polish made of TSFR.

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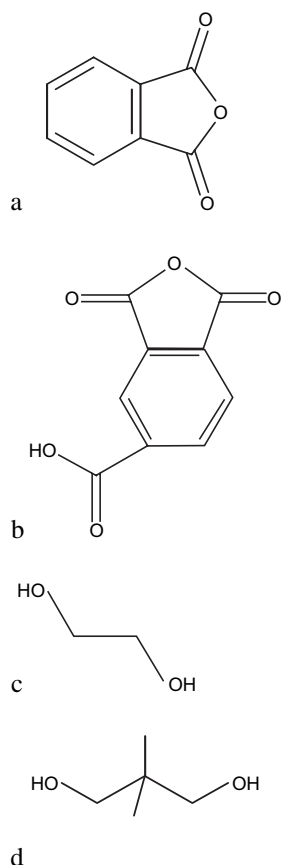


Fig. 1. Molecular structures of monomers. (a) Phthalic anhydride, (b) trimellitic anhydride, (c) ethylene glycol, (d) neopentyl glycol.