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Key words: 4-(bromomethyl)benzoic acid; airborne; allergic contact dermatitis; chemist; occupational.

Airborne contact dermatitis caused by powdered or volatile chemicals has been described in chemistry workers (1–3). Chemists are often exposed to multiple chemicals, and complete avoidance may be difficult.

Case Report

A 56-year-old female chemist, with a history of hand dermatitis and rubber allergy, developed facial swelling, erythema, and pruritic scaling during periods of teaching a laboratory course for chemistry students. The patient had been wearing long sleeve jackets and plastic protective gloves when working with chemicals, and she had no hand dermatitis. Systemic and local corticosteroids together with a sick leave period healed the facial dermatitis in a few weeks.

The history of the patient showed that she had worked as a scientist and teacher in the university since 1974. In a laboratory course for second-year chemistry students, the synthesis of 4-(bromomethyl)benzoic acid (CAS 6332-88-8) had been carried out since 1996, twice a year. In 2003, the patient experienced slight erythema and swelling in the eyelids. During the next 2 years, the patient did not teach in the laboratory. She

started again with laboratory courses in 2005. In spring 2006, she developed facial redness, swelling, itching, and scaling when teaching the first group of students to synthesize 4-(bromomethyl)benzoic acid from 4-methylbenzoic acid (Fig. 1).

The patient was patch tested using Finn Chambers® (Epitest Ltd Oy, Tuusula, Finland) on Scanpor® (Norgesplaster A/S, Vennesla, Norway) to the Finnish standard series (Fin-1000; Chemotechnique Diagnostics, Vellinge, Sweden), cosmetics and antimicrobials, and to the photoprotective chemicals. The patient's own chemicals were tested diluted at 1%, 0.1%, and 0.01% in pet. Thiuram mix in the standard series was ++ on D2 and D4. Several of her own chemicals, e.g. 4-methylbenzoic acid and benzoic acid were negative. 4-(Bromomethyl)benzoic acid 1% pet. was +++, 0.1% ++, and 0.01% + (Fig. 2). No patch test reactions were seen in 10 control subjects tested to 1% 4-(bromomethyl)benzoic acid. Prick tests with aeroallergens were negative.

Discussion

Airborne exposure may cause irritant or allergic dermatitis (4). Sensitization appeared evident in our patient because a concentration of 0.01% elicited a positive patch test reaction, and no reaction was seen in control subjects. Our patient tested negative for 4-methylbenzoic acid. Bromine is a highly reactive halogen, which may cause irritation too. A facial dermatitis was recently reported from

Airborne allergic contact dermatitis from 4-(bromomethyl)benzoic acid in a university chemist

Contact Dermatitis 2008; 58: 314–315

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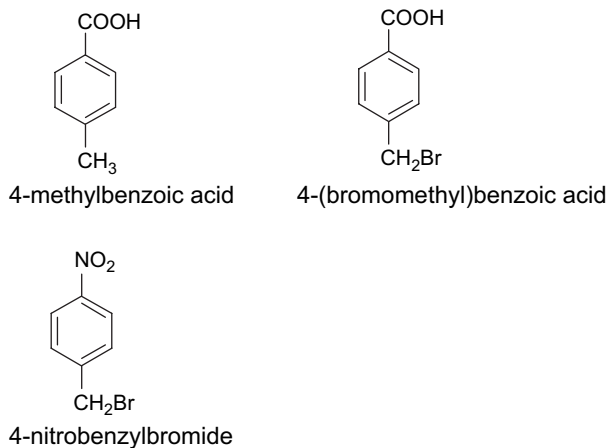


Fig. 1. Chemicals tested and 4-nitrobenzyl bromide for comparison.



Fig. 2. Positive patch test reactions to 4-(bromomethyl)benzoic acid in concentrations (from top to bottom) 1%, 0.1%, and 0.01%.

4-nitrobenzyl bromide, closely resembling 4-(bromomethyl)benzoic acid (2) (Fig. 1). A bromine radical is probably formed during the metabolic route of these benzylic derivatives. Further reactivity with skin proteins might lead to induction of contact sensitivity. Sensitization to non-aromatic bromine-containing chemicals has also been reported (5), and methyldibromo glutaronitrile has been a common sensitizer.

Our patient had a history of thiuram allergy and allergic hand dermatitis successfully treated with rubber avoidance. As thiurams and 4-(bromomethyl)benzoic acid are totally different chemicals, these contact allergies were apparently separate.

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