

CLINICAL SPECIFICATIONS

TRIMELLITIC + PHTHALIC ANHYDRIDES

Chemical Found In:

Trimellitic Anhydride (TMA) and Phthalic Anhydride (PA) are used in the production of epoxy and alkyd resins of coating materials. They are also used to provide flexibility to plastics found in common household use. Phthalates are easily released into the environment because there is no covalent bond between the phthalates and plastics in which they are mixed.

Sources:

Trimellitic Anhydride

<https://www.cdc.gov/niosh/docs/78-121/>

Phthalates

http://www.ehhi.org/ehhi_plastics_report_2008.pdf

Known Cross-Reactions:

Clinical Significance:

The detection of antibodies to Trimellitic + Phthalic Anhydrides bound to human protein in serum indicates a breakdown in immunological tolerance and induction of chemical intolerance. TMA + PA or their metabolites can bind to human tissue proteins and form neo-antigens. These new antigens are comprised of the haptenic chemical plus the tissue antigen. The formation of neo-antigens initiates an immune response which may result in antibody production against the chemical and the human tissue. Continued exposure to the chemical and the subsequent production of antibodies against various tissue antigens, may result in autoimmune reactivity.

Persons with antibodies to Trimellitic + Phthalic Anhydrides bound to human protein in serum should avoid exposure to the substances.

References:

1. Bornehag, et al. The association between asthma and allergic symptoms in children and phthalates in house dust: a nested case-control study. *Environ Health Perspect*, 2004; 112:1393-1397.
2. Crinnion. Toxic effects of easily avoidable phthalates and parabens. *Altern Med Rev*, 2010; 15(3):190-196.
3. Farraj, et al. Topical application versus intranasal instillation: a qualitative comparison of the effect of the route of sensitization on trimellitic anhydride-induced allergic rhinitis in A/J mice. *Toxicologic Sci*, 2006; 92(1):321-328.
4. Kuper, et al. Molecular characterization of trimellitic anhydride-induced respiratory allergy in brown Norway rats. *Toxicologic Pathol*, 2008; 36:985-998.
5. Pakarinen, et al. Phthalic anhydride allergy: development and characterization of optimized hapten-carrier conjugates for improved diagnosis. *Allergy*, 2002; 57(10):894-899.