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**THE METHACRYLATE PRODUCERS ASSOCIATION'S POSITION
ON USE OF METHACRYLIC ACID AND UNREACTED
METHACRYLATE MONOMERS LIQUID FORM
IN COSMETIC PRODUCTS**

The Methacrylate Producers Association, Inc. (MPA) believes that methacrylic acid and its esters (including methyl methacrylate, ethyl methacrylate, n-butyl methacrylate, isobutyl methacrylate, lauryl methacrylate, and 2-ethylhexyl methacrylate) in unreacted monomeric liquid form are not appropriate for use in cosmetics. The known corrosive properties of the acid and skin sensitization properties of the esters, as underscored by recent reports of injury due to their use in some nail products, indicates their use in cosmetics should be restricted.

MPA is an association of U.S. manufacturers of methacrylic acid and methacrylates, whose members include Evonik Cyro, Arkema Inc., Lucite International, and The Dow Chemical Company. MPA and its members have product stewardship programs to control appropriate use of the chemicals they market. MPA members have for many years recommended that methacrylic acid and its esters in their unreacted monomeric liquid form not be used in cosmetics.

Public and Governmental Concern

The hazards of unreacted methyl methacrylate (MMA) use in cosmetic nail products have been known for decades. The Food and Drug Administration (FDA) seized numerous MMA-containing nail products in the 1970's and has warned against MMA use in cosmetics ever since. FDA has warned more broadly in its Cosmetic Handbook (June 1989) (at 27-28) that:

Nail builders (elongators, extenders) have been involved in numerous reports of irritation, inflammation and infection of nail bed and nail fold as well as complaints of discoloration, splitting and loss of

fingernails...The methacrylate monomers currently used in nail builders are mostly ethyl, hydroxyethyl, butyl, isobutyl, hydroxypropyl or other esters of methacrylic acid. Methyl methacrylate is now rarely used.... The currently used esters of methacrylic acid may be as harmful as methyl methacrylate. (emphasis added).

FDA's belief that MMA is rarely used has proven not to be the case in recent years. Numerous reports of its increasing use in nail products have led to a flurry of articles in the beauty salon trade press and national media.

Legislation has passed in several states to prohibit use of MMA-containing nail products. For example, Kentucky and Maryland banned use of liquid nail enhancement products containing monomeric MMA. Delaware's Board of Cosmetology and Barbering banned use of MMA. Ohio's Board has already prohibited MMA use in nail products, and Oregon's Board has recommended against such use. Texas Board regulations have banned MMA nail use since 1974, the time of the initial FDA actions. In total, approximately 30 states have banned the use of MMA in nail salons.

With the renewed increasing pressures against MMA, MPA is concerned that other unreacted methacrylate monomers may be substituted in cosmetic products. Like FDA, we are concerned that their use "may be as harmful" as MMA unreacted monomer use.

MPA has also provided information to FDA and the Consumer Product Safety Commission (CPSC). MPA supported the CPSC's issuance of a requirements that consumer nail products containing methacrylic acid be packaged in child-resistant containers. It has urged FDA to restrict cosmetic use of MAA and its esters in their unreacted liquid form.

MPA's Petition to the Cosmetic Ingredients Review Board

MPA asked the Cosmetics Ingredient Review Expert Board (CIR) by letter of August 28, 1998, to review use of methacrylic acid and its basic esters in their unreacted liquid form in cosmetics including nail products and to find such use inappropriate. In June 1999, however, the Board voted not to rescind its prior approval of the use of EMA in nail products. CIR has unfortunately permitted use of the other esters as well. More recently, the CIR has approved a variety of methacrylate esters (but not MMA) for use in cosmetics.

The Hazards of Cosmetic Use

The hazards posed by use of unreacted methacrylic acid and methacrylate monomers in nail products have again been highlighted by several recent studies. Most significantly, Dr. Woolf's January 1998 article in the Archives of Pediatric and Adolescent Medicine collected reports of severe burns in children due to exposure to artificial nail primers whose primary ingredient was methacrylic acid. Dr. Woolf found the artificial fingernail primers were not polymers, but rather greater than 70% free methacrylic acid. As the article notes, some of these products may be intended for purchase by professional beauticians; but they are also widely available to, and used by, the consuming public given the current trend in artificial fingernail application toward more home application (of products intended for professional use). At home, caveats against skin contact are much less likely to be heeded, and accidental exposures of children have occurred.

The Woolf article supplements the extensive documentation of the corrosivity of the acid and the skin sensitization properties of the methacrylate monomers. Of most relevance to assessing whether acid or monomeric methacrylate use is appropriate in cosmetics are four recent studies. A skin irritation study of methacrylic acid in rabbits (Rohm and Haas 1997) found evidence of corrosivity with exposures as short as 3 minutes. Kanerva, *et al.* (1997) found 48 of 275 tested patients had allergic reactions to at least one methacrylate ester. Significantly, *both* methyl methacrylate *and* ethyl methacrylate caused reactions in about 8% of the subjects. Rustemeyer *et al.* (1998) report on their recent research on the sensitizing properties of, and cross-reactivity patterns among, the methacrylates; they also include a summary of the extensive prior research on methacrylate sensitization. Tucker & Beck (1999) reviewed 14,000 patch tests administered over the past 15 years. Methyl and ethyl methacrylate ranked similarly with 4.8% and 4.5%, respectively, positive results.

Other reports of adverse effects of methacrylic acid and methyl methacrylate in nail products have been collected in the ECETOC Joint Assessment of Commodity Chemicals reviews of the acid and of MMA. All the reports indicate that each of the esters poses a sensitization and cross-sensitization risk that makes these industrial chemicals inappropriate for cosmetic use.

Conclusion

Through their product stewardship programs, MPA members have for many years recommended that methacrylic acid and its esters in their unreacted monomeric liquid form not be used in cosmetics. Although disappointed that the CIR did not share their concerns about use of EMA and other esters in nail products, the MPA will continue to share with public health and governmental authorities the scientific literature that indicates the corrosivity of MAA and the sensitization properties of its esters makes these compound inappropriate for cosmetic use.

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