

Commentary on- Electrodeposited nickel (and other metal) allergenic effects: Some further thoughts

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Nickel allergy has been a recognized medical problem since about 1975 but since 1985 its incidence has grown rapidly because of the increasing habit of piercing the body for jewelry decoration especially amongst men. It is not life-threatening, merely annoying. It is apparent as a red skin rash in the vicinity of any subsequent contact with nickel. There is no pharmaceutical solution to date and the problem is best tackled by elimination of nickel-blood sensitization from the metallurgical origin and creams applied to the skin. At present there appears to be no detailed statistical data in the public domain probably because it is not life-threatening!

This paper reviews the metallurgical origins, based mainly on the use of surface coatings of nickel in a metal finishing stage of manufacturing personal accessories (e.g. buckles, clips, jewelry particularly earrings, zips, buttons, spectacles etc.) the purpose being to minimize corrosion yet maintain good aesthetic appearance. It should be appreciated that while the topcoat is gold, it is very thin for economic reasons and consequently porous so allowing nickel at the base of the pore to make contact with the surrounding liquids such as blood. The paper also indicates some practical ways of elimination of nickel as an undercoat for gold by using, for example, copper-tin electrodeposits whose appearance is similar to nickel.

The paper also considers evidence of toxicity for other metals and lists scientific literature sources for further information primarily for metallurgists. The hazard associated with cupro-nickel alloys typically in 'white metal' coinage is not considered serious. The widespread use of cupro-nickel alloys for white metal coinage represents a major usage in many countries and because of the regular contact with perspiring hands has been a concern. Furthermore the increasing use of duplex metal coins with a ring or disc of such metal in contact with a bronze alloy, the design being employed to minimize the risk of counterfeiting for the higher value coins, has been of concern because a galvanic couple between the two metals will promote

corrosion with nickel likely to be selectively released on to the palms of hands. However, the evidence to date in Europe, where such coins have been in circulation for over ten years as one and two euro denominations, is that the risk is negligible unless the hands are covered with very corrosive liquids as an obvious occupational hazard.

Several important papers offering different approaches to the problem of metal toxicity as a skin allergy effect may be cited.

- Review of metals in general from a historical viewpoint prior to 2000 which set the scene for present concern (1,2).
- An account of ongoing metallurgical research with the aim of developing a test to identify metallurgical situations especially pores in coatings, which will warn manufacturers and designers of artefacts and persona accessories of allergy risk (3).

The obvious question frequently raised relates to alternative metals which may be used and this has long been a metallurgical consideration. The important factors are ductility for manufacture, appearance and tarnish resistance in service, and cost. The basis metal is usually copper or brass with electroplated coating of nickel plus silver or gold. In the quality or deluxe market solid silver or gold alloy is common. Other metals which are considered include platinum and palladium (1,2).

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