of the highest stresses formed within the amalgam. The constant cold working experienced by amalgam in the oral environment may activate the diffusion of free tin in the amalgam and tin diffusion into the adjacent hard tissues. Also, since the γ_2 phase is the phase in amalgam most susceptible to corrosion,[14] some of this tin may be carried to the hard tissue as a corrosion product.

Further study of this phenomenon should be conducted to determine the rate of diffusion of tin into hard tissue, as well as the effects of tin on hard tissue.

Conclusions

The disappearance of the $\gamma_2(HgSn_{7-8})$ phase has been detected in dental amalgam samples that were subjected to pressures up to 50 kb. X-ray diffraction studies have shown that this disappearance occurs over several months to a year in different samples. Since each sample acted differently, and not all samples showed significant change in one year, the diffusion rate could not be estimated. It does appear that the mercury-to-alloy ratio and the presence of zinc and copper in the alloy have no effect.

The activation of tin diffusion is caused by the severe cold working and plastic deformation that the samples experience at high pressures; the phase disappearance does not occur in samples not exposed to pressure. Some of the free tin probably diffuses into the γ_1 phase and stabilizes the structure, as discussed by Johnson[9]; tin atoms also diffuse into the surrounding hard tissues.

The authors thank R. S. Gilmore and R. Courtney for their help in this project. Thanks are also due to Japan Electron Optics Laboratories Co., Ltd., Tokyo, Jap, for the use of their scanning electron microscope.

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