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[\[Image PDF \(168K\)\]](#) [\[References\]](#)**Analysis of Chemical Interaction of 4-MET with Hydroxyapatite Using XPS**

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**Abstract:**

Each dental adhesive contains a specific functional monomer that determines its actual adhesive performance to tooth tissue. 4-methacryloxyethyl trimellitic acid (4-MET) is well-known as one of the functional monomers mostly available and consequently widely used in commercial adhesives. We therefore characterized the chemical interaction of 4-MET with hydroxyapatite (HAp) using X-ray Photoelectron Spectroscopy (XPS). XPS revealed that the peak representing -COO- of 4-MET shifted to a lower binding energy, when 4-MET was adsorbed onto HAp. Deconvolution of this shifted peak disclosed two components with a peak representing unreacted carboxyl groups and ester groups, and a peak suggesting chemical bonding of other carboxyl groups to Ca of HAp. XPS spectra of HAp

treated with 4-MET also disclosed the surface to be enriched in calcium and decreased in phosphorus, indicating that phosphorus was extracted at a relatively higher rate than calcium. It can thus be concluded that true chemical bonding of 4-MET with calcium present in HAp occurred, as it was proven using XPS.

**Key words:**

[Adhesion](#), [4-MET](#), [XPS](#)

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