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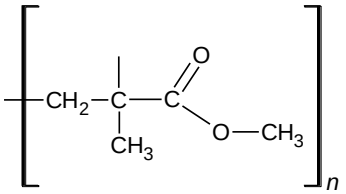
COMPOSITE MATERIALS BASED ON DENTAL ACRYLIC PLASTIC AND CHITOSAN

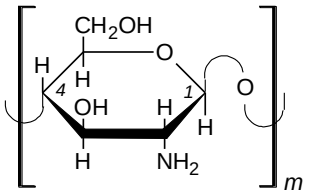
Yakovishin L. A., Tkachenko E. V.
Sevastopol State University, 33 University St., Sevastopol, 299053, Russia
E-mail: chemsevntu@rambler.ru

Abstract. Poly (methyl methacrylate) or poly (methyl 2-methylpropenoate) (PMMA) is one of the most important polymers in industry and medicine. PMMA is widely used in dentistry practice for the fabrication of dentures.[1]

Polysaccharide chitosan is used for obtaining new biomedical materials. Chitosan has antitumoral, antioxidative, bacteriostatic and fungistatic properties.[2] The block copolymer of chitosan with PMMA was obtained.[3]



PMMA



Chitosan

Composites **1**–**3** of chitosan and PMMA were obtained by *in situ* polymerization with heating at different temperatures. To obtain composite **3**, mechanochemical activation was preliminarily carried out by grinding chitosan and PMMA powders for 120 min. The source of PMMA was the Villacryl H Plus heat-curing acrylic resin for denture bases. The resulting composites were analyzed by ATR FT-IR spectroscopy.

Composites **1**–**3** are formed due to hydrogen bonds ($C{=}O_{PMMA}\ldots H{-}O_{Chitosan}$ and $C{=}O_{PMMA}\ldots H{-}NH_{Chitosan}$) and hydrophobic interactions. It is possible that the presence of chitosan in composite materials can change some of their mechanical properties and eliminate the toxicity of PMMA.

References

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