



## **Content of Fe, Cu and Pb in human teeth enamel and dentin in relation to the age**

**Olovčić A., Memić M., Selović A.**

*University of Sarajevo, Faculty of Science, Department of Chemistry*

---

### **Keywords:**

Iron,  
copper,  
lead,  
enamel,  
dentin,  
FAAS

### **Corresponding author:**

Olovčić Almir

### **E-mail:**

almirolovcic@hotmail.com

Tel:+38761513590

Fax:

**Abstract:** The content of iron, copper and lead was determined in 25 human teeth samples from Sarajevo and Bihać by using flame atomic absorption spectrometry (FAAS). The aim of this study was to test whether the content of these metals increased with the age of the subjects. Samples were split on enamel and dentin by burning at 500°C and by using mechanical separation. For the dissolution, concentrated nitric acid and hydrogen peroxide was used. Concentration of Pb was below detection limit using the applied method in 7 dentin samples and even 18 enamel samples. It is for these reasons that we took as relevant results of Pb content those in dentin and not the ones in enamel. Results have shown cumulative effect for all three metals. This effect is more pronounced in enamel than dentin since in enamel the concentration of Cu and Fe was twice as high. The average concentration of Fe in enamel was 51.54, 73.87, 73.97 and 122.40 ppm; while the concentration of Cu was 0.19, 0.33, 0.72 and 1.53 ppm for persons aged 18-30, 31-59, 51-70 and over 70 years, respectively. A similar trend with less pronounced differences was detected in dentin for Fe and Cu while the concentration of Pb in dentin was 0.18, 1.39, 2.34 and 4.41 ppm for the specified age.

---

### **Sažetak**

Određivan je sadržaj željeza, bakra i olova u 25 uzoraka zuba osoba iz Sarajeva i Bihaća metodom plamene atomske apsorpcione spektrometrije (FAAS). Cilj je bio provjeriti da li se sadržaj ovih metala povećava sa starošću osoba. Uzorci su spaljivanjem na 500 °C i mehaničkim odvajanjem razdvojeni na caklinu i dentin. Rastvaranje je vršeno u smjesi koncentrovane nitratne kiseline i vodik peroksida. Koncentracija Pb bila je ispod granice određivanja primijenjenom metodom u 7 uzoraka dentina i čak 18 uzoraka cakline. Iz navedenih razloga kao relevantni su uzeti rezultati za sadržaj Pb u dentinu, ali ne i caklini. Rezultati su pokazali kumulativni efekat za sva tri metala. Ovaj efekat je izraženiji za caklinu nego za dentin kod Fe i Cu gdje je njihova koncentracija u caklini bila i 2 puta veća nego u dentinu. Prosječna koncentracija željeza u caklini bila 51.54, 73.87, 73.97 i 22.40 ppm, a bakra 0.19, 0.33, 0.72 i 1.53 ppm za starosnu dob osoba 18-30, 31-50, 51-70 i iznad 70 godina redom. Sličan trend sa manje izraženim razlikama zabilježen je i za dentin kod Fe i Cu dok je koncentracija Pb u dentinu bila 0.18, 1.39, 2.34 i 4.41 ppm za navedene starosne dobi.