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Određivanje veštačkog zaslađivača neotama u rečnim sedimentima

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Veštački zaslađivači predstavljaju emergentne zagađujuće materije u životnoj sredini. Decenijama se koriste kao aditivi u ishrani i farmaceutskim proizvodima, zbog čega su široko rasprostranjeni u prirodnim vodama, usled nepotpunog prečišćavanja otpadnih voda. Međutim, pojedini zaslađivači, poput neotama, poseduju visok afinitet za adsorpciju na sedimentu prilikom raspodele u sistemu voda-sediment. Zbog toga je u ovom radu razvijen i optimizovan postupak pripreme uzoraka sedimenata metodom ultrazvučne ekstrakcije za određivanje tragova neotama. Nakon predtretmana, rečni sedimenti (2 g) su ekstrahovani pomoću dihlormetana (3×5 cm^3) u ultrazvučnom kupatilu u trajanju od 3×5 min. Dobijeni ekstrakti su analizirani metodom tečne hromatografije sa tandem masenom spektrometrijom. Razvijena metoda je primenjena na uzorke sedimenata iz nekoliko reka u Srbiji – Tise, Morave, Save i Dunava. Po prvi put su dobijeni podaci o stepenu zagađenosti sedimenata u Srbiji veštačkim zaslađivačem neotamom, detektovanom u koncentracijama od 2 do 48 μg g^{-1}.

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Determination of artificial sweetener neotame in river sediments

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Artificial sweeteners are known as emerging pollutants in the environment. For decades they have been used as food and pharmaceutical additives, which is why they are widespread in natural waters, due to incomplete wastewater treatment. However, some sweeteners, such as neotame, possess a high sorption affinity and partition to sediment in the water-sediment system. Therefore, in this paper, a method for the sediment sample preparation using an ultrasonic extraction for determination of neotame traces was developed and optimized. After pre-treatment, river sediments (2 g) were extracted using dichloromethane (3×5 cm^3) in an ultrasonic bath for 3×5 min. The obtained extracts were analyzed by liquid chromatography with tandem mass spectrometry. The developed method was applied to sediment samples from several rivers in Serbia – the Tisza, the Morava, the Sava and the Danube. For the first time, data on the contamination level of sediments in Serbia with artificial sweetener neotame (in the concentration range from 2 to 48 μg g^{-1}) were obtained.

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