

In Memoriam: Professor NEDELJKO KRSTAJIĆ

Nedeljko Krstajić. Professor of Corrosion, Physical Chemistry and Electrochemical Kinetics of The Faculty of Technology and Metallurgy at the University of Belgrade died August 17th. 2017. His working experience which lasted almost 40 years was committed to education and science and by imposing high standards to great achievement of his own, as well as to the surrounding he worked in.

The students will remember him not only as an exceptional professor, but as well as a man of great tact and appreciation, ready to include, permanently, a talented and hard working student, through serious scientific research, into the scientific community.

Fanatic in his work professor Krstajić was a rare combination of good engineer and passionate scientist, who with equal success solved actual problems in chemical industry and the most subtle fundamental problems of corrosion and protection of materials, electrochemical kinetics and electroorganic synthesis. Professor Krstajić showed his great research talent and scientific potential very early, working on his doctoral thesis on titanium anodes with coatings of ruthenium oxide and titanium oxide and their electrocatalytic properties. On the basis of these researches the technology of the production of titanium anodes was developed and applied in industrial plants for production of chlorine and chlorate. By using of these anodes the device for production of hypochlorite for disinfection of drinking water was developed, produced and market in our country. For this project he got an award for innovation "Water Chloration at the Place of Use" of the Economic Chamber of the city of Belgrade. Besides the work on development of anodes professor Krstajić developed and patented the procedures for the production of cathodes for application in industrial plants for the one of the most important companies for chlorine production "De Nora" Italy.

At the beginning of his career he intensively worked on electrochemical metals deposition and the influence of deposition parameters on their morphology with the biggest achievement on mathematical and physical model of metal deposits. These researches were basis for the chapter of Modern Aspect of Electrochemistry published with professor Popov.

The great part of the researches of the professor Krstajić referred to hydrogen reaction – kinetics of hydrogen evolution as a reaction of water electrolysis, oxidation of hydrogen as a reaction in fuel cells, electrochemical adsorption and desorption of hydrogen in nickel-metal hydride fuel cells and polysaccharides hydrogenation dealing with electro organic synthesis. Professor Krstajić summarized the results from this field of research in his monography Electrochemical Aspects of Hydrogen Reaction based on his 29 scientific papers, published mainly in leading international journals.

He worked on corrosion not only through education but through scientific and applied researches. He researched the kinetics of corrosion on metals and alloys, and different aspects of protection against corrosion, as well electroconductive coating polymers and anodic inhibitors. As in titanium anodes, the results of fundamental researches resulted in application in practice, so he worked on projection of cathode protection, anode and protector corrosion protection. On the Faire Bruxelles 1992 he got gold medal for innovation "Simultaneous Cathode Protection and Protection of Growth Covering of Ships in Sea Water". He was certainly one of the biggest experts for corrosion in our country.

The last field in research by which professor Krstajić dealt with was nanocatalysts for reactions in fuel cells, from synthesis of catalyst supports, first carbonic than later oxide and carbide, deposition of nanoparticles of catalysts to inspection of reaction of oxygen reduction, oxidation of hydrogen and methanol. About 40 published papers in prestige international journals and magazines are the best confirmation of his work on these problems.

Speaking of modest conditions in which one worked he pointed out that the idea was the most important and the facts dealing with poor conditions should encourage us to be more imaginative and creative. As far as he was concerned it was true.

The death of professor Krstajić is a loss for Serbian electrochemistry, as well as critical idea in scientific community, and his friends, colleagues and students which were not indifferent to his warmth, care for others, sparkling ideas and specific humor.

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Nedeljko Krstajić profesor Korozije, Fizičke Hemije i Elektrohemijske kinetike na Tehnološko-metalurškom fakultetu, Univerziteta u Beogradu, preminuo je 17. avgusta 2017.god. Radni vek, dug gotovo 40, godina profesor Krstajić je posvetio obrazovanju i nauci doprinoseći svojim visokim standardima velikom ugledu kako svom tako i sredine u kojoj je radio i stvarao.

Studenti će ga pamtiti ne samo kao izuzetnog predavača već i kao čoveka sa puno takta i uvažavanja spremnog da vrednog i talentovanog studenta, kroz ozbiljan naučno istraživački rad, trajno uključi u naučnu zajednicu.

Zanesenjak u poslu profesor Krstajić je bio retka kombinacija dobroga inženjera i pasioniranog naučnika koji je sa jednakim uspehom rešavao konkretne probleme u hemijskoj industriji dok se istovremeno bavio najsuptilnijim fundamentalnim problemima korozije i zaštite materijala, elektrohemijske kinetike i elektroorganske sinteze. Veliki istraživački talenat i naučni potencijal prof. Krstajić je ispoljio veoma rano radeći doktorsku disertaciju u kojoj se bavio titanskim anodama sa prevlakama od rutenijum oksida i titan oksida i njihovim elektrokatalitičkim osobinama. Na bazi ovih istraživanja razvijena je tehnologija proizvodnje titanskih anoda koje su primenjene u industrijskim pogonima za proizvodnju hlora i hlorata. Primenom ovih anoda razvio je uređaj za proizvodnju hipohlorita za dezinfekciju vode za piće, koji se danas proizvodi i plasira u našoj zemlji. Za ovaj projekat dobio je nagradu za inovaciju "Hlorisanje vode na mestu upotrebe" od Privredne Komore grada Beograda. Pored rada na razvoju anoda, prof. Krstajić je sa jednom od najpoznatijih kompanija za proizvodnju hlora, "De Nora" iz Italije, razvio i patentirao postupke za izradu katoda za primenu u industrijskim pogonima za proizvodnju hlora i hlorata.

Na početku karijere intenzivno se bavio i elektrohemijskim taloženjem metala i uticajem parametara taloženja na njihovu morfologiju, pri čemu je najveći doprinos bio matematički i fizički model formiranja sunderastih metalnih taloga. Iz ovih istraživanja proizašlo je poglavlje u Modernim aspektima elektrohemije koje je objavio sa prof. Popovim.

Veliki deo istraživanja prof. Krstajića odnosio se na vodoničnu reakciju – kinetika izdvajanja vodonika kao reakcija u elektrolizi vode, oksidacija vodonika kao reakcija u gorivnim spregovima, elektrohemijska adsorpcija i desorpcija vodonika sa stanovišta nikal-metalhidrid akumulatora i hidrogenovanje polisaharida sa ciljem elektroorganskih sinteza. Rezultate iz ove oblasti prof. Krstajić je sumirao u monografiji pod naslovom Elektrohemijski aspekti vodonične reakcije koja je bazirana na njegovih 29 naučnih radova, objavljenih najvećim delom u vodećim međunarodnim časopisima.

Bavio se korozijom ne samo kroz nastavu već i kroz naučni rad i primenjena istraživanja. Ispitivao je kinetiku korozionih procesa na metalima i legurama i razne vidove zaštite od korozije, kao što su prevlake od elektroprovodnih polimera i anodni inhibitori. Kao i u slučaju titanskih anoda, rezultati fundamentalnih istraživanja su rezultovali primenom u praksi, pa se tako bavio projektovanjem sistema katodne zaštite, anodnom i protektorskom zaštitom. Na sajmu inovacija "Brisel 1992" dobio je zlatnu medalju za inovaciju "Istovremena katodna zaštita i zaštita od obrastanja brodova u morskoj vodi". Može se slobodno reći da je bio jedan od najvećih stručnjaka za koroziju u našoj zemlji.

Poslednja oblast istraživanja kojom se prof. Krstajić bavio su bili nanokatalizatori za reakcije u gorivnim spregovima, od sinteze nosača katalizatora, prvo ugljeničnih, a kasnije i oksidnih i karbidnih, nanošenja nanočestice katalizatora do ispitivanja reakcije redukcije kiseonika, oksidacije vodonika i metanola. 40-tak objavljenih radova u prestižnim međunarodnim naučnim časopisima najbolja je potvrda njegovoga rada na ovoj problematici.

Govoreći o skromnim uslovima u kojima se bavio istraživačkim radom isticao je da je najvažnija ideja, a to što radimo u lošim uslovima nas podstiče da budemo maštovitiji. U njegovom slučaju to je bila istina.

Smrću prof. Krstajića izgubila je srpska elektrohemija, izgubila je kritička misao u našoj naučnoj sredini, ali i njegovi prijatelji, kolege i studenati koji nisu bili ravnodušni na njegovu toplinu, brigu za druge, vrcavu misao i specifični humor.

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