



**Dr. Habil. Maria Bercea**

Senior Scientist I

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## Research topics

- Rheology of complex fluids including solutions, suspensions and (hydro)gels;
- Thermodynamics of polymer solutions; polymer/protein interactions in hybrid materials;
- Smart polymeric biomaterials;
- Self-healing hydrogels and soft materials;
- Polymer blends.

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## Results of scientific activity

- 157 papers indexed by Web of Science (polymer and material science, engineering, chemistry, physics);
- 2 books, 11 book chapters;
- involved in 42 research projects obtained through national competitions (10 as project leader), 12 grants/contracts financed from abroad (at 6 projects as responsible from the Romanian side);
- attended over 100 national and international scientific conferences;
- Hirsh index = 23, more than 1400 citations (excluding self-citations).

## Relevant publications

- M. Bercea, B.A. Wolf, Detection of polymer compatibility by means of self-organization: poly(ethylene oxide) and poly(sodium 4-styrenesulfonate), *Soft Matter*, 17(20), 5214-5220, **2021**, <https://doi.org/10.1039/D1SM00170A>
- M. Bercea M., I.-A. Plugariu, Associative interactions between pullulan and negatively charged bovine serum albumin in physiological saline solutions, *Carbohydrate Polymers* 246, 116630, **2020**, <https://doi.org/10.1016/j.carbpol.2020.116630>
- M. Bercea, S. Morariu, Real-time monitoring the order-disorder conformational transition of xanthan gum, *Journal of Molecular Liquids*, 309, 113168, **2020**, <https://doi.org/10.1016/j.molliq.2020.113168>
- M. Bercea, L.M. Gradinaru, I.A. Plugariu, M. Mandru, D.L. Tigau, Viscoelastic behaviour of self-assembling polyurethane and poly(vinyl alcohol), *Polymer International*, 69(2), 149-155, **2020**, <https://doi.org/10.1002/pi.5928>
- M. Bercea, G. Biliuta, M. Avadanei, M. Butnaru, S. Coseri, Self-healing hydrogels of oxidized pullulan and poly(vinyl alcohol), *Carbohydrate Polymers*, 206, 210-219, **2019**, <https://doi.org/10.1016/j.carbpol.2018.11.001>
- M. Bercea, B.A. Wolf, Associative behavior of  $\kappa$ -carrageenan in aqueous solutions and its modification by different monovalent salts as reflected by viscometric parameters, *International Journal of Biological Macromolecules*, 140, 661–667, **2019**, <https://doi.org/10.1016/j.ijbiomac.2019.08.144>
- M. Bercea, L.M. Gradinaru, M. Mandru, C. Ciobanu, D.L. Tigau, Intermolecular interactions and self-assembling of polyurethane with poly(vinyl alcohol) in aqueous solutions, *Journal of Molecular Liquids*, 274, 562–567, **2019**, <https://doi.org/10.1016/j.molliq.2018.11.018>
- M. Bercea, B.A. Wolf, Intrinsic viscosities of polymer blends: Sensitive probes of specific interactions between the counterions of polyelectrolytes and uncharged macromolecules, *Macromolecules*, 51(19), 7483-7490, **2018**, <https://doi.org/10.1021/acs.macromol.8b01422>
- M. Bercea, B.A. Wolf, Dependence of solvent quality on the composition of copolymers: Experiment and theory for solutions of P(MMA-ran-t-BMA) in toluene and chloroform, *Soft Matter*, 11(3), 615–621, **2015**, <https://doi.org/10.1039/c4sm02568g>
- M. Bercea, B.A. Wolf, Thermodynamics of copolymer solutions: How the pair of interactions contribute to the overall effect, *Journal of Physical Chemistry B*, 118(31), 9414–9419, **2014**, <https://doi.org/10.1021/jp505155e>
- M. Bercea, S. Morariu, D. Rusu, In-situ gelation of aqueous solutions of entangled poly(vinyl alcohol), *Soft Matter*, 9, 1244-1253, **2013**, <https://doi.org/10.1039/c2sm26094h>
- M. Bercea, J. Eckelt, S. Morariu, B.A. Wolf, Islands of immiscibility for solutions of compatible polymers in a common solvent: experiment and theory, *Macromolecules*, 42(10), 3620–3626, **2009**, <https://doi.org/10.1021/ma9002769>
- M. Bercea, J. Eckelt, B.A. Wolf, Vapor pressures of polymer solutions and the modeling of their composition dependence, *Industrial & Engineering Chemistry Research*, 48(9), 4603–4606, **2009**, <https://doi.org/10.1021/ie801965h>
- M. Bercea, P. Navard Shear dynamics of aqueous suspensions of cellulose whiskers, *Macromolecules*, 33, 6011–6016, **2000**, <https://doi.org/10.1021/ma000417p>
- M. Bercea, C. Ioan, S. Ioan, B.C. Simionescu, C.I. Simionescu, Ultrahigh molecular weight polymers in dilute solutions, *Progress in Polymer Science*, 24, 379–424, **1999**, [https://doi.org/10.1016/S0079-6700\(99\)00007-6](https://doi.org/10.1016/S0079-6700(99)00007-6)