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Honorary note: Zygmunt Sadowski

Prof. Zygmunt Sadowski was born in 1947 in Wroclaw. In 1965-1970 he studied chemistry at the Wroclaw University, and he graduated with a B.Sc. in chemistry in 1970. According to prof. Sadowski, the chemistry gene was passed on to him by his parents. The professor's parents were chemists and graduated at the University of Vilnius before World War II. In the first years after the war, professor's parents worked at University and Polytechnic in Wroclaw. Professor Sadowski continues this work now.

After graduation, prof Sadowski worked as an assistant at the Department of Inorganic Chemistry at the Economics University in Wroclaw. Professor Sadowski often states that three events had an impact on his science carrier. The first was to start working for ZBiPM "Cuprum" Wroclaw. Working in "Cuprum" made opportunity to contact the copper industry. Postgraduate studies in the Mineral Processing organized by the Mining and Metallurgy University (AGH) was an event to a better understanding of the mineral processing industry. It was also an opportunity to meet outstanding AGH professors such as prof. W. Stepniewski, prof. K. Sztaba, prof. W. Pudło, prof. A. Pomianowski and many other. Also, in "Cuprum" the cooperation with prof. J. Laskowski was started. This cooperation resulted in numerous reports for industry and a doctoral dissertation. The doctoral dissertation entitled "Selective coagulation and flocculation mineral suspensions" was defended by prof. Sadowski in 1978 at the Wroclaw University of Technology, where he began working since 1976 at the Mineral Processing Department. This Department was headed by prof. J. Laskowski.

The second significant event in prof Sadowski's scientific carrier was a trip to the USA for a scholarship at the University of Nevada (Reno), the Iowa State University (Ames) and the University of Utah (Salt Lake City). The period of science work at American universities was a time of deepening knowledge and gaining new scientific experience. It was also an opportunity to cooperate with American professors. The topics related to the mineral bioprocessing and the stability of suspensions were worked out with prof Ross W. Smith in Nevada. The research on the phenomenon of selective agglomeration of coal suspensions was conducted at the Iowa State University together with professor Thomas Wheelock. In the Utah University, prof Sadowski worked on the problem of fine coal particles flotation using carbon dioxide. This work was performed under the supervision of the distinguished professor Jan D. Miller. What professor Sadowski remembers are university libraries with complete scientific journals from the first to the last issue. It should be reminded that the internet was unavailable at that times.

Prof. Sadowski received his habilitation (D.Sc.) in 1996 from the Maria Curie Sklodowska University Lublin (UMCS). In 1998, prof Sadowski transferred from the Department Inorganic Chemistry and Metallurgy Rare Elements to the Department of Chemical Engineering and Heating Equipment. Scientific research conducted at the Department of Chemical Engineering covered issues in the field of bioleaching of different ores and mineral wastes. The second area of research was related to fine particles treatment such as flotation, selective flocculation, agglomeration. In recent years, prof Sadowski conducts research on the synthesis of nanoparticles used by microorganisms and plant extracts. The fruits of long research are book chapters. An important task carried out by professor Sadowski in the Chemical Engineering Department was educating PhD students. Professor Sadowski

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was the supervisor of 13 doctoral dissertations. The six doctors (prof. I. Polowczyk, Dr. A. Bastrzyk, Dr. A. Pawlowska, Dr. J. Ulatowska, Dr. A. Dawiec-Liśniewska, Dr. D. Podstawczyk) promoted by the professor continue the activities at the Wroclaw University of Science and Technology. The rest of promoted doctors achieved a career in the industry such as Dr. A. Szubert "KGHM-Polska Miedz SA", Dr. E. Szeląg "Rokita PCC EXOL", Dr. J. Barańska "Colgate" and Dr. A. Didyk-Mucha "Selena SA". Professor Sadowski is the author of 104 scientific papers, 2 patents, 65 conference papers, 6 monographs and 19 chapters in books. His book "*Biogeochemistry – selected issues*" is the basis for students studying biohydrometallurgy. Currently, professor Sadowski is managing two European grants: BioLeach (EIT) and Bionanopolys (Horizon 2020).

List of publications:

1. Z. Sadowski, J. Mager, J. Laskowski, „Hindered settling of coagulating suspensions", Powder Technol., 21(1) (1978) 73-79.
2. Z. Czyszczon, Z. Sadowski, J. Laskowski, „Wpływ dysperganta (Cataflot P-40) na stabilność wodnych zawiesiń kalcytu i magnezytu", Fizykochem. Probl. Miner., 12 (1980) 157-165 (in polish).
3. Z. Sadowski, J. Laskowski, „Hindered settling - a new method of the i.e.p determination of minerals", Colloids Surf., 1 (1980) 151-159.
4. Z. Sadowski, „Selektywna agregacja drobnych ziarn w procesach przeróbczych", Fizykochem. Probl. Miner., 14 (1982) 3-19.
5. Z. Sadowski, R.W. Smith, „Stability of mineral suspensions in the absence and presece of collectors dispersants and flocculants", Miner. Metall. Process., 2(4) (1985) 217-222.
6. Z. Sadowski, R.W. Smith, „Effect of metal ions on the stability and zeta potential of barite suspensions", Miner. Metall. Process., 4(2) (1987) 114-117.
7. Z. Sadowski, J. Sulkowski, „Odzysk magnezytu z odpadów skał magnezowych", Fizykochem. Probl. Miner., 20 (1988) 97-106 (in polish).
8. Z. Sadowski, R.W. Smith, „Effect of alkyl sulfate chain length on flocculation and flotation of barite suspensions", Colloids Surf., 33 (1988) 239-248.
9. Z. Sadowski, R.W. Smith, „Heteroflokulacja dwuskładnikowych zawiesiń mineralnych baryt-hematyt, baryt-tlenek glinu i baryt-kwarc", Rudy Met. Nieżel., 33(7) (1988) 240-244 (in polish).
10. Z. Sadowski, R. Venkatadri, J.M. Druding, R. Markuszewski, T.D. Wheelock, „Behavior of oxidized coal during oil agglomeration", Coal Prep., 6 (1988) 17-34.
11. Z. Sadowski, R.W. Smith, „The stability of semi-soluble salt type mineral suspensions in oleate solution", J. Dispers. Sci. Technol., 10(6) (1989) 715-737.
12. Z. Sadowski, „Adsorpcja oleinianu sodu na powierzchni kalcytu i magnezytu w obecności odczynników dyspergujących", Fizykochem. Probl. Miner., 21 (1989) 157-169 (in polish).
13. Z. Sadowski, „The effect of dispersant reagents on the sodium oleate adsorption at the salt minerals-water interface", J. Dispers. Sci. Technol., 12(3/4) (1991) 289-302.
14. Z. Sadowski, „The effect of iron ions on the oil agglomeration of oxidized coal", Miner. Eng., 4(2) (1991) 173-178.
15. Z. Sadowski, Z. Gołąb, R.W. Smith, „Flotation of Streptomyces pilosus after lead accumulation", Biotechnol. Bioeng., 37(10) (1991) 955-959.
16. Z. Sadowski, „The influence of sodium lignin sulfonate on the adsorption of sodium dodecyl sulfate on salt-type mineral surfaces", Miner. Eng., 5(3-5) (1992) 421-428.
17. Z. Sadowski, „The spherical oil agglomeration of barite suspensions in the presence of surfactant and cosurfactant", Colloids Surf. A Physicochem. Eng. Asp., 80 (1993) 147-152.
18. Z. Sadowski, „The influence of the sodium oleate adsorption on the behavior of calcite suspensions", Chem. Eng. Sci., 48(2) (1993) 305-312.
19. Z. Sadowski, „A study on hydrophobic aggregation of calcite aqueous suspensions", Powder Technol., 80(2) (1994) 93-98.
20. Z. Sadowski, „Biomodyfikacja własności powierzchniowych minerałów", Wiad. Chem., 48(1/2) (1994) 37-48 (in polish).

21. Z. Sadowski, „Biosurfaktanty i biomodyfikatory w przeróbce surowców mineralnych", Wiad. Chem., 49 (9/10) (1994) 591-607 (in polish).
22. Z. Sadowski, „Selective spherical agglomeration of fine salt-type mineral particles in aqueous solution", Colloids Surf. A Physicochem. Eng. Asp., 96 (1995) 277-285.
23. Z. Sadowski, „Biogeochemia żelaza i manganu", Wiad. Chem., 51 (11/12) (1997) 757-770 (in polish).
24. J. Gaweł, I. Maliszewska, Z. Sadowski, „The effect of biopretreatment on the flotation recovery of magnesite tailings", Miner. Eng., 10(8) (1997) 813-824.
25. J. Drzymała, Z. Sadowski, L. Hołysz, E. Chibowski, „Ice/water interface: zeta potential, point of zero charge, and hydrophobicity", J. Colloid Interface Sci., 220(2) (1999) 229-234.
26. Z. Sadowski, T. Farbiszewska, J. Farbiszewska-Bajer, „Izolowanie bakterii rodzaju thiobacillus ze złoża złotostockiego", Fizykochem. Probl. Miner., 33 (1999) 191-199 (in polish).
27. Z. Sadowski, E. Jażdżyk, T. Farbiszewska, J. Farbiszewska-Bajer, „Biooxidation of mining tailings from Zloty Stok", Fizykochem. Probl. Miner., 34 (2000) 47-56.
28. Z. Sadowski, „The role of surfactant salts on the spherical agglomeration of hematite suspension", Colloids Surf. A Physicochem. Eng. Asp., 173 (1-3) (2000) 211-217.
29. Z. Sadowski, I. Polowczyk, „Effect of polymer-surfactant adsorption on the hindered settling of a mineral suspension", Adsorp. Sci. Technol., 19(3) (2001) 245-254.
30. E. Jażdżyk, Z. Sadowski, „Wpływ uziarnienia odpadów arsenopirytowych na kinetykę procesu bioutleniania", Inżynieria Chemiczna i Procesowa, 22(3C) (2001) 561-566 (in polish).
31. I. Polowczyk, Z. Sadowski, „Przewodnictwo elektryczne zawiesin mineralnych w procesie sedymentacji", Inżynieria Chemiczna i Procesowa, 22(3D) (2001) 1175-1180 (in polish).
32. Z. Sadowski, „Effect of biosorption of Pb(II), Cu(II) and Cd(II) on the zeta potential and flocculation of nocardia sp", Miner. Eng., 14(5) (2001) 547-552.
33. Z. Sadowski, „Agglomerate flotation of fine MgO and ZnO particles at the presence of polymer and surfactant", Annales UMCS Sectio AA (Chemia), 57 (2002) 259-270.
34. M. Costa, A. Uryga, Z. Sadowski, „The use of N,N,-dimethyl-N,N-diphenylmalonamide for iron(III) extraction", Fizykochem. Probl. Miner., 36 (2002) 317-326.
35. M. Broncel, Z. Sadowski, „Dyfuzja tlenu wewnątrz filmu z polimeru w trakcie procesu bioługowania", Prace Naukowe Wydziału Chemicznego Politechniki Wrocławskiej. Prace Badawcze Studentów, 1 (2003) 121-124 (in polish).
36. E. Jażdżyk, Z. Sadowski, „Effect of artificial polymer film on biooxidation of arsenopiryte wastes", Fizykochem. Probl. Miner., 37 (2003) 69-76.
37. Z. Sadowski, E. Jażdżyk, H. Karaś, „Bioleaching of copper ore flotation concentrates", Miner. Eng., 16(1) (2003) 51-53.
38. Z. Sadowski, I. Polowczyk, „Agglomerate flotation of fine oxide particles", Int. J. Miner. Process., 74(1-2) (2004) 85-90.
39. Z. Sadowski, I. Polowczyk, E. Jażdżyk, A. Szubet, „Effect of polymer-surfactant interaction onto the spherical agglomeration", Fizykochem. Probl. Miner., 38 (2004) 351-358.
40. A. Uryga, Z. Sadowski, A. Grotowski, „Bioleaching of cobalt from mineral products", Fizykochem. Probl. Miner., 38 (2004) 291-299.
41. Z. Sadowski, I. Polowczyk, E. Jażdżyk, A. Szubert, „Application of biosurfactants for the mineral surfaces modification", Annales UMCS Sectio AA (Chemia), 60 (2005) 336-346.
42. A. Bastrzyk, I. Polowczyk, Z. Sadowski, „The effect of surfactants adsorption on the hindered settling of magnesite solid waste", Fizykochem. Probl. Miner., 39 (2005) 211-218.
43. E. Jażdżyk, Z. Sadowski, I. Polowczyk, A. Uryga, „Wpływ temperatury na kinetykę procesu bioługowania odpadów flotacyjnych z Zakładu Wzbogacania Rud Lubin", Rudy Met. Nieżel., 50(2) (2005) 77-81 (in polish).
44. T. Farbiszewska, J. Farbiszewska-Kiczma, E. Jażdżyk, Z. Sadowski, A. Szubert, „Kinetic study of biodegradation of organic matter extracted from black shale ore", Physicochem. Probl. Miner. Process., 40 (2006) 317-325.
45. A. Szubert, M. Łupiński, Z. Sadowski, „Application of shrinking core model to bioleaching of black shale particles", Physicochem. Probl. Miner. Process., 40 (2006) 211-225.
46. A. Szubert, Z. Sadowski, C.P. Gros, J.M. Barbe, R. Guilard, „Identification of metalloporphyrins extracted from the copper bearing black shale of Fore Sudetic Monocline (Poland)", Miner. Eng., 19(11) (2006) 1212-1215.

47. I. Polowczyk, E. Drąg, A. Bastrzyk, Z. Sadowski, „Application of spherical agglomeration process in the formation of adsorbents from fly ash", Polish J. Chem. Technol., 8(4) (2006) 95-99.
48. M. Costa, I.M. Michalak, Z. Sadowski, S. Natu, P. Paiva, „The solvent extraction of iron(III) from chloride solutions by N,N'-tetrasubstituted malonamides : structure-activity relationships", Solvent Extr. Ion Exch., 25(4) (2007) 463-484.
49. I. Polowczyk, A. Bastrzyk, T. Koźlecki, P. Rudnicki, W. Sawiński, Z. Sadowski, A. Sokołowski, „Application of fly ash agglomerates in the sorption of arsenic", Polish J. Chem. Technol., 9(2) (2007) 37-41.
50. Z. Sadowski, A. Szubert, „Comparison of kinetics of black shale bioleaching process using stationary and agitated systems", Physicochem. Probl. Miner. Process., 41 (2007) 387-395.
51. P. d'Hugues, P.R. Norris, B. Johnson, A. Grotowski, T. Chmielewski, A. Łuszczkiewicz, Z. Sadowski, A. Skłodowska, T. Farbiszewska, „Presentation of the FP6 European Project Bioshale: Exploitation of black shale ores using biotechnologies - Polish case studies", Physicochem. Probl. Miner. Process., 41 (2007) 373-385.
52. Z. Sadowski, A. Brzozowska, I. Polowczyk, „Transport of lons in Quartz Sand", Rocz. Ochr. Sr., 10 (2008) 93-102.
53. A. Bastrzyk, I. Polowczyk, E. Szeląg, Z. Sadowski, „The effect of protein-surfactant interaction on magnesite rock flotation", Physicochem. Probl. Miner. Process., 42 (2008) 261-270.
54. I. Polowczyk, A. Bastrzyk, T. Koźlecki, W. Sawiński, I. Wróbel, Z. Sadowski, „Oil agglomeration of mineral tailings in mixed-surfactant systems", Czas. Techn. Ch, Chemia, 105(2-Ch) (2008) 219-228.
55. I. Polowczyk, Z. Sadowski, D. Smoczyńska, „Biomodification of plastic surfaces and depression process", Annales UMCS Sectio AA (Chemia), 63 (2008) 111-121.
56. Z. Sadowski, I. Maliszewska, B. Grochowalska, I. Polowczyk, T. Koźlecki, „Synthesis of silver nanoparticles using microorganisms", Mater. Sci.-Poland, 26(2) (2008) 419-424.
57. I. Polowczyk, Z. Sadowski, E. Drąg, A. Bastrzyk, „Preparation of mineral-carbon adsorbents from flotation tailings using the spherical agglomeration technique", Pol. J. Chem., 829(1/2) (2008) 149-158.
58. Z. Sadowski, I. Maliszewska, I. Polowczyk, T. Koźlecki, B. Grochowalska, „Biosynthesis of colloidal-silver particles using microorganisms", Pol. J. Chem., 82(1/2) (2008) 377-382.
59. I. Maliszewska, Ł.S. Aniszkiewicz, Z. Sadowski, „Biological synthesis of gold nanostructures using the extract of Trichoderma koningii", Acta Phys. Pol. A, 116 (2009) 163-165.
60. B. Ozdoba, I. Wróbel, Z. Sadowski, „Wpływ biosurfaktantów na transport cząstek koloidalnych w złożu porowatym", Prace Naukowe Wydziału Chemicznego Politechniki Wrocławskiej. Prace Badawcze Studentów, 7 (2009) 107-111 (in polish).
61. Z. Sadowski, I. Maliszewska, „Otrzymywanie nanocząstek metali metodami biotechnologii", Rudy Met. Nieżel., 54(10) (2009) 614-618 (in polish).
62. A. Szymańska, Z. Sadowski, I. Maliszewska, A. Szubert, „Ługowanie laterytowych rud niklonośnych z użyciem grzybów pleśniowych", Rudy Met. Nieżel., 54(7) (2009) 404-409 (in polish).
63. A. Szymańska, Z. Sadowski, A. Szubert, A. Grotowski, „Badania wstępne nad mikrobiologicznym odzyskiem niklu z polskich rud laterytowych", Cuprum, 1/2 (2009) 107-121 (in polish).
64. I. Wróbel, I. Polowczyk, Z. Sadowski, „Transport cząstek koloidalnych z zaadsorbowanymi jonami arsenu przez mineralne złoże porowate", Rocz. Ochr. Sr., 11(2) (2009) 1119-1388 (in polish).
65. I. Maliszewska, Z. Sadowski, „Synthesis and antibacterial activity of silver nanoparticles", J Phys. Conf. Ser., 146 (2009) 1-6 (in polish).
66. I. Polowczyk, A. Bastrzyk, W. Sawiński, T. Koźlecki, P. Rudnicki, Z. Sadowski, A. Sokołowski, „Właściwości sorpcyjne popiołów ze spalania węgla", Inż. Apar. Chem., 49(1) (2010) 93-94 (in polish).
67. A. Szymańska, Z. Sadowski, „Effects of biosurfactants on surface properties of hematite", Adsorption, 16(4-5) (2010) 233-239.
68. I. Polowczyk, A. Bastrzyk, T. Koźlecki, W. Sawiński, P. Rudnicki, A. Sokołowski, Z. Sadowski, „Use of fly ash agglomerates for removal of arsenic", Environ. Geochem. Health, 32(4) (2010) 361-366.
69. Z. Sadowski, A. Szubert, „Modelling of bioleaching kinetics of black shale ore based on changes of the surface area", Chem. Process Eng-inz., 31(1) (2010) 107-118.
70. Z. Sadowski, I. Polowczyk, A. Frąckowiak, T. Koźlecki, S. Chibowski, „Bioinspired synthesis of calcium carbonate colloid particles", Physicochem. Probl. Miner. Process., 44 (2010) 205-214.
71. I. Maliszewska, Z. Sadowski, A. Skłodowska, A. Leśkiewicz-Laudy, „Wykorzystanie metod biotechnologicznych do otrzymywania nanocząstek metali", Polimery, 56(2) (2011) 140-145 (in polish).

72. A. Kotowska, J. Barańska, Z. Sadowski, „Bioługowanie odpadów uranowych", Prace Naukowe Wydziału Chemicznego Politechniki Wrocławskiej. Prace Badawcze Studentów, 9 (2011) 117-120 (in polish).
73. I. Polowczyk, A. Bastrzyk, W. Sawiński, T. Koźlecki, P. Rudnicki, Z. Sadowski, „Sorption properties of fly ash from brown coal burning towards arsenic removal", Czas. Techn. Ch, Chemia, 108(8) (2011) 135-142.
74. A. Bastrzyk, I. Polowczyk, Z. Sadowski, A. Sikora, „Relationship between properties of oil/water emulsion and agglomeration of carbonate minerals", Sep. Purif. Technol., 77(3) (2011) 325-330.
75. M. Kałuża, Z. Sadowski, „The effect of nonionic surfactants on citric acid biosynthesis and A. niger morphology in submerged cultures", Copernican Letters 3 (2012) 101-111.
76. K. Poszelużna, J.A. Barańska, Z. Sadowski, „Bioługowanie w kolumnie rudy łupkowej", Prace Naukowe Wydziału Chemicznego Politechniki Wrocławskiej. Prace Badawcze Studentów, 10 (2012) 141-146 (in polish).
77. A. Didyk-Mucha, Z. Sadowski, „Flotation of serpentinite and quartz using biosurfactants", Physicochem. Probl. Miner. Process., 48(2) (2012) 607-618.
78. A. Bastrzyk, I. Polowczyk, Z. Sadowski, „Influence of hydrophobicity on agglomeration of dolomite in cationic-anionic surfactant system", Sep. Sci. Technol., 47(9) (2012) 1420-1424.
79. A. Bastrzyk, I. Polowczyk, E. Szeląg, Z. Sadowski, „Adsorption and co-adsorption of PEO-PPO-PEO block copolymers and surfactants and their influence on zeta potential of magnesite and dolomite", Physicochem. Probl. Miner. Process., 48(1) (2012) 281-293.
80. M. Pruska, A. Didyk-Mucha, Z. Sadowski, „Modyfikacja właściwości powierzchniowych i flotacja rudy serpentynitowej", Prace Naukowe Wydziału Chemicznego Politechniki Wrocławskiej. Prace Badawcze Studentów, 11 (2013) 131-135 (in polish).
81. P. Nowak, J.A. Barańska, Z. Sadowski, „Bioługowanie odpadów uranowych w kolumnie", Prace Naukowe Wydziału Chemicznego Politechniki Wrocławskiej. Prace Badawcze Studentów, 11 (2013) 119-123 (in polish).
82. M. Kałuża, Z. Sadowski, „Optymalizacja bioprodukcji kwasu cytrynowego w hodowli wgłębnej Aspergillus niger prowadzonej w obecności Tweenu 80", Inż. Apar. Chem., 52(4) 332-333 (in polish).
83. A. Bastrzyk, I. Polowczyk, Z. Sadowski, „Aglomeracja olejowa skały magnezytowej z udziałem mieszaniny jonowych surfaktantów", Rocz. Ochr. Sr., 15(2) (2013) 1441-1459 (in polish).
84. I. Polowczyk, A. Bastrzyk, T. Koźlecki, Z. Sadowski, „Calcium carbonate mineralization. Pt. 1, The effect of poly(ethylene glycol) concentration on the formation of precipitate", Physicochem. Probl. Miner. Process., 49(2) (2013) 631-639.
85. J.A. Barańska, Z. Sadowski, „Bioleaching of uranium minerals and biosynthesis of UO2 nanoparticles", Physicochem. Probl. Miner. Process., 49(1) (2013) 71-79.
86. B.L. Rivas, Z. Sadowski, „Bacterial generation of liquid arsenic waste and the application of water-soluble polymers for arsenic ions separation", Rev. Environ. Sci. Biotechnol., 13(3) (2014) 277-284.
87. I. Polowczyk, A. Bastrzyk, T. Koźlecki, Z. Sadowski, „Characterization of glass beads surface modified with ionic surfactants", Sep. Sci. Technol., 49(11) (2014) 1768-1774.
88. D. Podstawczyk, A. Witek-Krowiak, K. Chojnacka, Z. Sadowski, „Biosorption of malachite green by eggshells: mechanism identification and process optimization", Bioresour. Technol., 160 (2014) 161-165.
89. K. Pokomeda, A. Dawiec, D. Podstawczyk, A. Witek-Krowiak, S. Modelski, Z. Sadowski, „Modelowanie matematyczne procesu perwaporacji roztworu woda-etanol z wykorzystaniem metod CFD oraz teorii Flory-Hugginsa", Inż. Apar. Chem., 53(1) (2014) 29-30 (in polish).
90. J. Ulatowska, I. Polowczyk, W. Sawiński, A. Bastrzyk, T. Koźlecki, Z. Sadowski, „Use of fly ash and fly ash agglomerates for As(III) adsorption from aqueous solution", Polish J. Chem. Technol., 16(1) (2014) 21-27.
91. A. Didyk-Mucha, I. Polowczyk, Z. Sadowski, J. Kudełko, „Electrokinetic and flotation investigations of surface properties modification of magnesite and serpentinite using biosurfactants and surfactants", Journal of Physical Science and Application, 5(2) (2015) 87-95.
92. A. Kozak, Z. Sadowski, „Effect of pluronics and surfactant adsorption onto dolomite suspension zeta potential and stability", Annales UMCS Sectio AA (Chemia), 70(1) (2015) 41-53 (in polish).
93. J.A. Barańska, Z. Sadowski, „Badania wpływu różnych dodatków na odzysk miedzi w procesie bioługowania rudy łupkowej w kolumnie", Cuprum, 2 (2015) 147-156 (in polish).
94. I. Polowczyk, A. Bastrzyk, T. Koźlecki, Z. Sadowski, „Stability of three-phase water-particle-oil systems", Chem. Eng. Technol., 38(4) (2015) 715-720.

95. I. Polowczyk, A. Bastrzyk, T. Koźlecki, E. Grządka, Z. Sadowski, „Calcium carbonate mineralization. Pt. 2, Effect of poly(ethylene glycol) and block copolymers molecular weight on formation of precipitate", Physicochem. Probl. Miner. Process., 51(2) (2015) 587-600.
96. I. Polowczyk, A. Bastrzyk, J. Ulatowska, E. Szczałba, T. Koźlecki, Z. Sadowski, „Influence of pH on arsenic(III) removal by fly ash", Sep. Sci. Technol., 51(15/16) (2016) 2612-2619.
97. A.M. Pawłowska, Z. Sadowski, „Biosynthesis of copper nanoparticles using aqueous extracts of aloe vera and geranium and bioleaching solutions", Solid State Phenom., 262 (2017) 193-196.
98. A.M. Pawłowska, I. Wróbel, Z. Sadowski, „The colloid hematite particle migration through the unsaturated porous bed at the presence of biosurfactants", Environ. Sci. Pollut. Res., 24(21) (2017) 17912-17919.
99. A.M. Pawłowska, Z. Sadowski, „Influence of chemical and biogenic leaching on surface area and particle size of laterite ore", Physicochem. Probl. Miner. Process., 53(2) (2017) 869-877.
100. Z. Sadowski, J.A. Barańska, A.M. Pawłowska, „Surface properties of neutral components in copper column bioleaching of black shale samples", Physicochem. Probl. Miner. Process., 54(4) (2018) 1146-1151.
101. A.M. Pawłowska, M. Kazimierczak, Z. Sadowski, „Physicochemical parameters effect on biosynthesis and properties of copper nanoparticles", Physicochem. Probl. Miner. Process., 55(6) (2019) 1460-1466.
102. A. Didyk-Mucha, A.M. Pawłowska, Z. Sadowski, „Modification of mineral surfaces by adsorption of biosurfactants produced by Streptomyces sp.", Colloids Surf. A Physicochem. Eng. Asp., 579 (2019) 123667.
103. A.M. Pawłowska, Z. Sadowski, „Effect of schwertmannite surface modification by surfactants on adhesion of acidophilic bacteria", Microorganisms, 8(11) (2020) 1725.
104. A.M. Pawłowska, Z. Sadowski, „Bioleaching solutions used for the nanoparticles biosynthesis for uranium and arsenic immobilization", Solid State Phenom., 304 (2020) 45-50.

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