

Curriculum vitae – Maciej Manecki

Current position

Professor at the Department of Mineralogy, Petrography and Geochemistry, AGH University of Kraków, al. Mickiewicza 30, 30-059, Kraków, Poland

Date of birth: 1960-12-30, Kraków, Poland.

e-mail: gpmmanec@cyf-kr.edu.pl

cell phone: +48 604 427 198

Research profile

Mineralogist and chemist specializing in geochemistry of minerals and experimental design of industry-related processes. Currently focusing on beneficiation of rare earth elements (patented method), as well as immobilization of As, U, and Th with the use of lead apatites and zeolites. Research interests include experimental mineralogy and geochemistry, geochronology, Polar regions, and environmental protection. Expert in apatites. Trained in very broad range of analytical techniques and instrumentation, particularly focusing on phase and chemical analysis of mineral-water interaction, precipitation and dissolution of minerals containing metals; experienced in unconventional/pushing the limits use and application of traditional analytical techniques. Extensive laboratory field experience, in all climates, including design and management of research programs, budget, student and scientific personnel, coordination of experiments or fieldwork, and design of field and laboratory experiments. Designed several model field and laboratory experiments; designed procedures for synthesis of mineral analogs; analyzed, processed, and interpreted mineralogical, microbial, and geochemical data resulting from field and laboratory experiments. Orchestrated domestic and international project collaborations, including logistics and diplomacy as well as research design and execution.

Education

2021 professor nomination

2009 habilitation in geochemistry, AGH University of Science and Technology, Kraków, Poland

1999 PhD in geochemistry, Kent State University, Kent, Ohio, USA

1989 MSc in chemistry, Jagiellonian University, Kraków, Poland

1985 MSc in applied mineralogy, AGH University of Science and Technology, Kraków, Poland

Relevant work experience

2010 – present: professor, Department of Mineralogy, Petrography and Geochemistry, AGH University of Kraków (formerly AGH University of Science and Technology), Kraków, Poland

1986 – 2009 Assistant Professor, Department of Mineralogy, Petrography and Geochemistry, AGH University of Science and Technology, Kraków, Poland.

Also:

2023 – researcher (one semester) at the Department of Earth Sciences, *Mineralogy, Petrology and Tectonics*, Uppsala University, Uppsala

2019 – researcher (one month) at the Department of Earth Sciences, *Mineralogy, Petrology and Tectonics*, Uppsala University, Uppsala

2008 – Visiting Professor (one semester, teaching and research), Miami University, Oxford, OH, USA.

1999 – 2009 Assistant Professor, Department of Mineralogy, Petrography and Geochemistry, AGH University of Science and Technology, Kraków, Poland.

1999 – 2006 Department of Environmental Engineering, AGH International School of Technology, Kraków, Poland (collaboration effort of AGH and Illinois Institute of Technology, Chicago, IL, USA)

2005 Sturgeon Visiting Professor, Department of Geological Sciences, Ohio University, Athens, OH, USA

2004 Research Scientist, University of Notre Dame, South Bend, IN, USA

2000 – 2001 Post-doctoral Research Scientist, University of Notre Dame, South Bend, IN, USA

1993 – 1999 PhD position, Kent State University, Kent, Ohio, USA

1986 – 2021 field geologist, Geological Polar Expeditions to Spitsbergen (19 summer field seasons)

Supervised PhD projects and students

Graduated 7 PhDs as leading supervisor, all PhD students had external funding; supervised over 135 undergraduate and MSc diplomas. Ongoing 4 PhD students (expected completion 2025-29), all ongoing PhD students have external funding from Polish or foreign funds.

Grants and international projects (selected only if serving as PI)

- Polish National Research Centre research grant OPUS28 (2025 – 2029), “Immobilization of U and Th by Pb-activated zeolite”.
- Polish National Research Centre research grant PRELUDIUM BIS-3 (2022 – 2026), “Low temperature transformation of monazite (Ce,U,Th)PO₄ into pyromorphite Pb₅(PO₄)₃Cl – basic study for future technologies”.
- Polish National Research Centre research grant OPUS18 (2020 – 2023), “Substitutions of rare earth elements and U in lead apatite Pb₅(PO₄)₃Cl”.
- Polish National Centre for Research and Development NCBiR grant (2017 – 2023), principal investigator, “Applied doctoral studies in the field of engineering of functional geomaterials”.

- U.S. National Research Council Twinning Program, Research Grant for collateral American-Polish research (2002-2003), PI on Polish side, financed by American Academy of Science.
- Weber State University Research Grant, (2000-2001), Ogden (UT, USA), co-PI, „Dissolution of pyromorphite in lactic acid - an atomic force microscopy study.”
- Polish Ministry of Science and Higher Education Grant (2005-2008), “Crystal-chemistry of anionic substitution and thermodynamic properties of isostructural minerals from pyromorphite-mimetite-vanadinite solid solution series”
- International Polar Year research project – part of the cluster APEX (2007-2008), “Direct study of inorganic and microbial weathering of minerals in the foreland of a glacier retreating due to global warming”, partially funded by AGH-University of Science and Technology
- Polish Ministry of Science and Higher Education Grant (2006-2009), co-PI, “Age and character of Torellian unconformity in Wedel Jarlsberg Land, Spitsbergen”
- Polish Ministry of Science and Higher Education Grant for Ph.D. project: “Reduction of bioavailability of Pb and As by precipitation of pyromorphite and mimetite in the presence of bacteria”
- Polish Ministry of Science and Higher Education Grant, “Mechanisms of heavy metals mobilization in soils due to bacteria active scavenging for phosphate”
- Polish Ministry of Science and Higher Education Grant for Ph.D. project (2011-12): “Microbially enhanced dissolution of pyromorphite $Pb_5(PO_4)_3Cl$ – the effect on lead remobilization”
- Polish - American research grant funded by National Science Centre, Poland, PI on Polish side, dr John Rakovan (Miami University) was a PI from US, (2011-14): “Precise determination of dissolution constant K_{sp} at 5 – 65 °C, ΔH_f , ΔG_f , ΔS and C_p of apatite solid solutions in the series Ca-Pb-P-As-OH-Cl”
- Polish Ministry of Science and Higher Education Grant (2005-2008), “Crystal-chemistry of anionic substitution and thermodynamic properties of isostructural minerals from pyromorphite-mimetite-vanadinite solid solution series”

Current and recent commissions of trust and assignments

- former Director of PhD studies at the Faculty of Geology, Geophysics and Environmental Protection, AGH Kraków
- former member of the Recruitment board for PhD college at AGH University of Science and Technology
- former member of AGH Senate for two terms
- former panel member at Polish Research Council NCN (2011)

Professional Affiliations

- Mineralogical Society of Poland
- Mineralogical Society of America
- Polish Synchrotron Radiation Society

Bibliometric information

Orcid ID: [0000-0002-4937-1836](https://orcid.org/0000-0002-4937-1836)

Total number peer-reviewed original articles: 271 (Google Scholar), 66 (Web of Science)

Total number citations for peer-reviewed articles: 2179 (Google Scholar), 733 (Web of Science, no self-citations)

h-index: 28 (Google Scholar), 19 (Web of Science); i10-index: 53 (Google Scholar)

Patent

Method of obtaining rare earth metals from solutions obtained by leaching mineral and waste raw materials

<https://patents.google.com/patent/PL444079A1/en?q=PL444079A1>

Selection of recent publications

- Puzio, B., Manecki, M. 2025. Estimation of missing third-law standard entropy of apatite supergroup minerals using the optimized Volume-based Thermodynamics. *Contributions to Mineralogy and Petrology*. <https://doi.org/10.1007/s00410-024-02193-2>
- Solecka, U., Puzio, B., Kersten, M., Topolska, J., Manecki, M., Bajda, T. 2025. Solubility of mimetite $Pb_5(AsO_4)_3Cl$ – Vanadinite $Pb_5(VO_4)_3Cl$ solid solution series at 5–65° C. *Chemical Geology*. <https://doi.org/10.1016/j.chemgeo.2024.122609>
- Stępień, E., Maude, J., Buczek, D., Bottaro, M., Kappler, A., Manecki, M., Putnis, C. V. 2025. Removal of arsenate from aqueous solutions by transformation of cerussite to mimetite. *Chemical Geology*. <https://doi.org/10.1016/j.chemgeo.2024.122531>
- Stasz, K., Sordyl, J., Puzio, B., Manecki, M. 2025. Coprecipitation of Ce with lead phosphates. *Geochemistry*. <https://doi.org/10.1016/j.chemer.2025.126252>
- Puławska, A., Kalinowska, J., Rachubik, M., Drzewiecka, D., Albuquerque, L., Egas, C., Krawczyk, K., Manecki, M., Loch, C., Kowalewicz-Kulbat, M. 2025. Halophilic and Non-Halophilic Microbial Communities in Relation to Physico-Chemical Characteristics of Salt Mine Air. *Environmental Microbiology Reports*. <https://doi.org/10.1111/1758-2229.70095>
- Lintner, M., Balzano, S., Keul, N., Heinz, P., Manecki, M., Klimek, A., Wanek, W., Cyran, N., Gruber, D., Schmidt, K., Holzmann, M., Goleń, J., Tyska, J. 2025. Biosorption of heavy metals by microalgae: Hazardous side effects for marine organisms. *Chemosphere*. <https://doi.org/10.1016/j.chemosphere.2025.144080>
- Sordyl, J., Chamberlain, C.E., Sweet, T.F.M., Burns, P.C., Cronberger, K., Manecki, M. 2024. Immobilization of uranium from aqueous solutions by room-temperature precipitation of pyromorphite $[Pb_5(PO_4)_3Cl]$. *Polyhedron*. <https://doi.org/10.1016/j.poly.2024.116891>
- Waluś E., Jeleń P., Kozieł D., Manecki M. 2024. Effect of arsenate and phosphate substitution on hydroxyl group in libethenite Cu_2PO_4OH - olivenite Cu_2AsO_4OH solid solution series. *Materials Chemistry and Physics*. <https://doi.org/10.1016/j.matchemphys.2024.129391>
- Sordyl J., Stasz K., Leś M., Manecki M. 2023. Removal of REE and Th from solution by co-precipitation with Pb-phosphates. *Applied Geochemistry*. <https://doi.org/10.1016/j.apgeochem.2023.105780>

- Sordyl J., Rakovan J., Burns P., Topolska J., Włodek A., Szymanowski J.E.S., Sigmon G.E., Majka J., Manecki M. 2023. Single-crystal analysis of La-doped pyromorphite $\text{Pb}_5(\text{PO}_4)_3\text{Cl}$. *American Mineralogist*. <https://doi.org/10.2138/am-2022-8664>
- Staszek K., Jędras A., Skalny M., Dziewiątka K., Urbański K., Sordyl J., Rybka K., Manecki M. 2023. New synthetic [LREE (LREE = La, Ce, Pr, Sm), Pb]-phosphate phases. *Mineralogia*. <https://doi.org/10.2478/mipo-2023-0006>
- Puzio B., Zhang L., Szymanowski J.E.S., Burns P., Manecki M. 2023. Thermodynamic characterization of synthetic lead-arsenate apatites with different halogen substitutions. *American Mineralogist*. <https://doi.org/10.2138/am-2020-7452>
- Łukawska-Matuszewska K., Broclawik O., Brodecka-Goluch A., Rzepa G., Manecki M., Bolałek J. 2022. Biogeochemical and mineralogical effects of Fe-PS dynamics in sediments of continental shelf sea: Impact of salinity, oxygen conditions, and catchment area characteristics. *Science of Total Environment*. <https://doi.org/10.1016/j.scitotenv.2021.151035>
- Puzio B., Manecki M. 2022. The prediction method for standard enthalpies of apatites using the molar volume, lattice energy, and linear correlations from existing experimental data. *Contributions to Mineralogy and Petrology*. <https://doi.org/10.1007/s00410-022-01964-z>
- Gołuchowska K., Barker A.K., Manecki M., Majka J., Kościńska K., Ellam R.M., Bazarnik J., Faehrich K., Czerny J. 2022. The role of crustal contamination in magma evolution of Neoproterozoic metaigneous rocks from Southwest Svalbard. *Precambrian Research*. <https://doi.org/10.1016/j.precamres.2021.106521>
- Wudarska A., Sordyl J., Manecki M., Zawila A., Bajda T. 2022. Vibrational spectroscopic study of synthetic analogs of schultenite PbHAsO_4 – “phosphoschultenite” PbHPO_4 solid solution series. *Polyhedron*. <https://doi.org/10.1016/j.poly.2021.115534>
- Wala V.T., Ziemniak G., Majka J., Faehrich K., McClelland W.C., EE Meyer E.E., Manecki M., Bazarnik J., Strauss J.V. 2021. Neoproterozoic stratigraphy of the Southwestern Basement Province, Svalbard (Norway): Constraints on the Proterozoic-Paleozoic evolution of the North Atlantic-Arctic Caledonides. *Precambrian Research*. <https://doi.org/10.1016/j.precamres.2021.106138>
- Puzio B., Solecka U., Topolska J., Manecki M., Bajda T. 2021. Solubility and dissolution mechanisms of vanadinite $\text{Pb}_5(\text{VO}_4)_3\text{Cl}$: effects of temperature and PO_4 substitutions. *Applied Geochemistry*. <https://doi.org/10.1016/j.apgeochem.2021.105015>
- Puławska A., Manecki M., Flaszka M., Styszko K. 2021. Origin, distribution, and perspective health benefits of particulate matter in the air of underground salt mine: a case study from Bochnia, Poland. *Environmental Geochemistry and Health*. <https://doi.org/10.1007/s10653-021-00832-2>
- Maneck M., Kwaśniak-Kominek M., Majka J.M., Rakovan J. 2020. Model of interface-coupled dissolution-precipitation mechanism of pseudomorphic replacement reaction in aqueous solutions based on the system of cerussite PbCO_3 – pyromorphite $\text{Pb}_5(\text{PO}_4)_3\text{Cl}$. *Geochimica et Cosmochimica Acta*. <https://doi.org/10.1016/j.gca.2020.08.015>
- Kościńska K., Spear F.S., Majka J.M., Faehrich K., Manecki M., Piepjohn K., Dallmann W.K. 2020. Deciphering late Devonian–early Carboniferous P–T–t path of mylonitized garnet-mica schists from Prins Karls Forland, Svalbard. *Journal of Metamorphic Geology*. <https://doi.org/10.1111/jmg.12529>
- Maneck M. 2019. Lead in water and soil: speciation, toxicity, and treatment technologies. Chapter in: *Encyclopedia of Water: Science, Technology, and Society*. <https://doi.org/10.1002/9781119300762.wsts0230>
- Ziemniak G., Kościńska K., Schneider D.A., Majka J., Lorentz H., McClelland W.C., Wala V.T., Manecki M. 2019. Defining tectonic boundaries using detrital zircon signatures of Precambrian metasediments from Svalbard’s Southwestern Caledonian Basement Province. Chapter in: *GSA Special Papers: Circum-Arctic Structural Events*. [https://doi.org/10.1130/2018.2541\(05\)](https://doi.org/10.1130/2018.2541(05))
- Schneider D.A., Faehrich K., Majka J., Manecki M. 2019. $^{40}\text{Ar}/^{39}\text{Ar}$ geochronologic evidence of Eurekan deformation within the West Spitsbergen Fold and Thrust Belt. Chapter in: *GSA Special Papers: Circum-Arctic Structural Events*. [https://doi.org/10.1130/2018.2541\(08\)](https://doi.org/10.1130/2018.2541(08))
- Lempart M., Manecki M., Kwaśniak-Kominek K., Matusik J., Bajda T. 2019. Accommodation of the carbonate ion in lead hydroxyl arsenate (hydroxylmimetite) $\text{Pb}_5(\text{AsO}_4)_3\text{OH}$. *Polyhedron*. <https://doi.org/10.1016/j.poly.2019.01.027>