

Dr. Hurriyet Polat

Professor of Chemistry

Izmir Institute of Technology
College of Science, Department of Chemistry
Gulbahce, Urla-Izmir, TURKEY

Phone: +(90) (232) 750 7531

Fax: +(90) (232) 750 7509

e-mail: hurriyetpolat@iyte.edu.tr



Education

1992-1996

Doctor of Philosophy in Mineral Processing,

The Pennsylvania State University, University Park, PA, USA.

Thesis: "The Use of PEO/PPO Tri-block Copolymers to Enhance Fine Coal Cleaning by Flotation"

1990-1992

Master of Sciences in Mineral Processing,

The Pennsylvania State University, University Park, PA, USA.

Thesis: "Electrostatic Charge on Spray Droplets of Aqueous Electrolyte and Surfactant Solutions"

1983-1985

Master of Sciences in Soil Chemistry,

Aegean University, Izmir, Turkey.

Thesis: "The Importance of Alluvial Soils and an Investigation of the Relationships Between Their Physical and Chemical Properties"

1979-1983

Bachelor of Sciences in Soil Sciences,

Aegean University, Izmir, Turkey.

Thesis: "The Genetic Importance of Micro-nutritive Elements in Soils"

Interests

Physical Chemistry; Colloid Chemistry; Physico-Chemistry of Surfaces; Surfactants (Drug Delivery and Tissue Engineering applications); Nanotechnology; Flotation; Adsorption; Liquid/Liquid & Solid/Liquid

Extraction; Flocculation, Dispersion & Dewatering Systems; Paint and Coating applications).

Experience

2008-Present, Professor

The Department of Chemistry, College of Science, Izmir Institute of Technology, Izmir, Turkey.

2001-2008, Associate Professor

The Department of Chemistry, College of Science, Izmir Institute of Technology, Izmir, Turkey.

1996-2001, Assistant Professor

The Department of Chemistry, College of Science, Izmir Institute of Technology, Izmir, Turkey.

1989- 1996, Teaching and Research Assistant,

Mineral Processing Section, College of Earth & Mineral Sciences, The Pennsylvania State University, University Park, PA, USA.

1984-1987, Teaching & Research Assistant,

Soil Sciences Department, College of Agriculture, Aegean University, Izmir, Turkey.

Research

- **Production of nano-sized silica and silica boron composite nano particles with controlled size distribution and structure as filling materials for paint and coating applications.**
- **Designing of drug carriers for solvation and safeguarded delivery of strongly lipophilic anticancer drugs, Docetaxel, 5_Fluorouracil.**
- **Development of curcumin loded xylan nanoparticles bearing chitosan scaffolds for use in intestinal tissue engineering.**
- **Synthesis and characterization of marine based bio-foams as scaffolds.**
- **A study on Surfactant Adsorption by AFM**
- **A study on bio-polymers (chitin and chitosan) and their use in different applications such as heavy metal adsorption and oil emulsification.**
- **Characterization of Dental Ceramic Materials by AFM and SEM .**

- Dispersion and Flocculation Behaviour of Alumina in the presence of Mixed Surfactant Solutions.
- The Use of Flotation Process in Removing Heavy Metals from Industrial and Urban Waste Waters.
- The Use of Surface-Modified Lignites as Filter Bed Material in Removing Organic and Petroleum-Based Oils from Industrial Waste Waters.
- Coal and Fly Ash as Sorbents for the Removal of Boron from Water.
- Coal and Fly Ash as Sorbents for the Removal of Dyes from Water.
- Modification of Natural Zeolite for Use in Environmental Applications.

Courses

Undergraduate:

- Physical Chemistry, 3 credits (Chem-321)
- Surfactant Science and Technology, 3 credits (Chem-392)
- Introduction to Colloid and Surface Science, 3 credits (Chem-492)

Graduate

- Colloid and Surface Science, 3 credits (Chem-575)
- Interfacial Phenomena, 3credits (Che-577)

PUBLICATIONS

Polat, H., Zeybek, N., Polat, M. (2022). Tissue Engineering Applications of Marine-Based Materials. In: Jana, S., Jana, S. (eds) Marine Biomaterials. Springer, Singapore. https://doi.org/10.1007/978-981-16-5374-2_7, Published: 24 April 2022, Print ISBN978-981-16-5373-5, Online ISBN978-981-16-5374-2.

H. Polat, M. Polat, M. Cevik Eren, The effect of protein BSA on the stability of lipophilic drug (docetaxel)-loaded polymeric micelles, COLLOIDS AND SURFACES A: PHHYSICO-CHEMICAL ENGINEERING ASPECTS, Vol.631, 127712. 2021.

Polat H. Kutluay, G, Polat M, Analysis of dilution induced disintegration of micellar drug carriers in the presence of inter and intra micellar species, COLLOIDS AND SURFACES A: PHHYSICO-CHEMICAL ENGINEERING ASPECTS, Vol.601, 124989. 2020.

Mehmet Polat & Hurriyet Polat, Functional Chitosan: Chapter 7: Recent Advances in Chitosan-Based Systems for Delivery of Anticancer Drugs, Sougata Jana Subrata Jana Editors, Springer Nature Singapore Pte Ltd. 2019, pp.199-228.

Cihan E. Polat M. And Polat H, Designing of spherical chitosan nano-shells with micellar cores for solvation and safeguarded delivery of strongly lipophilic drugs, COLLOIDS AND SURFACES A: PHHYSICO-CHEMICAL ENGINEERING ASPECTS, Vol.529, pp. 815-823, 2017.

Köseoglu & H. Cengizler & L. İ. İsrail & H. Polat, Tannery wastewater sediments produced by clinoptilolite/polyacrylamide-aided flocculation as a clay additive in brick making, J AUST CERAM SOC., Vol. 53, pp. 719-731, 2017.

Aybike N. Olcay, Mehmet Polat, Hurriyet Polat, Ancillary effects of surfactants on filtration of low molecular weight contaminants through cellulose nitrate membrane filters, COLLOIDS AND SURFACES A: PHHYSICO-CHEMICAL ENGINEERING ASPECTS, Vol. 492, pp. 199-206, 2016.

Serkan Keleşoğlu, Mürşide Kes, Leman Sütçü and Hürriyet Polat, Adsorption of Methylene Blue from Aqueous Solution on High Lime Fly Ash: Kinetic, Equilibrium and Thermodynamic Studies, JOURNAL OF DISPERSION SCIENCE AND TECHNOLOGY, Vol. 01, 2012.

A. Kucukgulmez, M. Celik, Y. Yanar, D. Sen, H. Polat and E. Kadak, Physicochemical characterization of chitosan extracted from metapenaeus stebbingi shells, FOOD CHEMISTRY, 2011

K. Koseoglu, M. Polat and H. Polat, Encapsulating fly ash and acidic process waste water in brick structure, JOURNAL OF HAZARDOUS MATERIALS, Vol.176, pp. 957-964, 2010.

M. Polat and H. Polat, Analytical solution of poisson-boltzmann equation for interacting plates of arbitrary potentials and same sign, JOURNAL OF INTERFACE AND COLLOID SCIENCE, Vol.141, pp. 178-185, 2010.

M. Kes, H. Polat, S. Keleşoğlu, M. Polat and G. Aksoy, Determination of the particle interactions, rheology and the surface roughness relationship for dental restorative ceramics, JOURNAL OF EUROPEAN CERAMIC SOCIETY, Vol. 29, pp. 2959-2967, 2009.

H. Polat and D. Erdoğan, Heavy metal removal from waste waters by ion flotation, JOURNAL OF HAZARDOUS MATERIALS, Vol. 148, 267-278, 2007.

G. Aksoy, H. Polat, M. Polat, and G. Coskun, Effect of various treatment and glazing (coating) techniques on the roughness and wettability of ceramic dental restorative surfaces, JOURNAL OF COLLOIDS AND SURFACES B: BIOINTERFACES, Vol. 53, 254-259, 2006.

H. Polat, M. Molva, and M. Polat, Capacity and mechanism of phenol adsorption on lignite, INTERNATIONAL JOURNAL OF MINERAL PROCESSING, Vol. 79, 264-273, 2006.

A. Sakar-Deliormanlı, H. Polat, and M. Ciftcioglu, Alumina/water suspensions in the presence of PEO-PPO-PEO triblock co-polymers. JOURNAL OF THE EUROPEAN CERAMIC SOCIETY. Vol. 24, 3063-3072, 2004.

A. Sakar-Deliormanlı, M. Çiftçiöğlü and H. Polat, Effects of mechanical treatment on the formation of Al₂O₃ from gibbsite. KEY ENGINEERING MATERIALS. Vol. 264-268, 65-68, 2004.

H. Polat, A. Vengosh, I. Pankratov and M. Polat, A new methodology for removal of boron from water by coal and fly ash. DESALINATION, VOL. 164, 173–188, 2004.

M. Polat, H. Polat and S. Chander, Physical and chemical Interactions in coal flotation. INTERNATIONAL JOURNAL OF MINERAL PROCESSING, (D.W. FUERSTENAU SPECIAL VOLUME), VOL. 72, 199–213, 2003.

I. Rusonik, H. Polat, H. Cohen and D. Myerstein, Reaction of methyl radicals with metal powders immersed in aqueous solutions. EUROPEAN JOURNAL OF INORGANIC CHEMISTRY, 4227-4233, 2003.

I. Rusonik, H. Polat, H. Cohen and D. Meyerstein, Reduction of carbon dioxide during the synthesis of metal nano-particles in water. INORGANIC CHEMISTRY COMMUNICATIONS 6:1266-1268, 2003.

Şakar-Deliormanlı, H. Polat, and M. Çiftçiöğlü, Effect of PEO/PPO type block copolymers on dispersion behaviour of aqueous alumina suspensions. KEY ENGINEERING MATERIALS. Vol. 206-213,421-424, 2002.

M. Polat, H. Polat, S. Chander and R. Hogg. Characterization of airborne particles and droplets: Relation to amount of airborne dust and dust collection efficiency, PARTICLE AND PARTICLE SYSTEMS CHARACTERIZATION, VOL. 18, PP. 1–19, 2001.

M. Polat, H. Polat and S. Chander, Electrostatic charge on spray droplets of aqueous spray droplets, JOURNAL OF AEROSOL SCIENCE, Vol. 31, No. 5, 551, 2000.

H. Polat, M. Polat and S. Chander, Kinetics of dispersion of oil in the absence and presence of block co–polymers, JOURNAL OF AICHE, VOL. 45, 1866, 1999.

H. Polat, and S. Chander, Adsorption of PEO/PPO triblock co-polymers and wetting of coal. J. COLLOIDS AND SURFACES: A PHYSICO-CHEMICAL AND ENGINEERING ASPECTS, 146:199, 1999.

H. Polat, and S. Chander, Interaction between physical and chemical variables in flotation of low rank coals, J. MINERALS AND METALLURGICAL PROCESSING, 15:41, 1998.

H. Polat, M. Polat, S. Chander and R. Hogg, The electrostatic charge on particles and Its relation to agglomeration in air. JOURNAL OF APPLIED OCCUPATIONAL AND ENVIRONMENTAL HYGIENE, Vol. 11, No. 2, 817, 1996.

S. Chander, H. Polat and B. Mohal, Flotation and wettability of low-rank coals in the presence of surfactants. J. MINERALS AND METALLURGICAL PROCESSING, February. 55, 1994.

H. Polat, M. Polat and S. Chander, Deep cleaning of hva bituminous coal using a polyethyleneoxide–polypropyleneoxide block co–polymer. AMERICAN CHEMICAL SOCIETY–FUEL CHEMISTRY, VOL. 39, NO. 2, 405, 1994.

S. Chander, H. Polat and M. Polat, Coal flotation. JOURNAL OF ORE DRESSING. Vol. 6,11, 29-55, 2004.

*H. Polat and M. Polat*A Review of the theory of interactions between particles dispersed in aqueous media, III. electrostatic and structural interactions and the DLVO theory. JOURNAL OF ORE DRESSING, Vol. 4, 1, 2000.

H. Polat, M. Polat and S. Gurgen, Solunabilir Tozun Su Spreyleri Kullanarak Bastırılmasında Son Gelişmeler, MADENCILIK, Vol. 3, No. 1, 39, 2000.

M. Polat and H. Polat, A Review of the Theory of Interactions between Particles Dispersed in Aqueous Media, II. Van der Waals, INTERACTIONS JOURNAL OF ORE DRESSING, No. 3, p. 21, 2000.

A.N. Olcay, M. Polat and H. Polat, Morphology Of Micelles and Micellar Aggregates As A Function Of Electrolyte Valence And Concentration, PROCEEDING OF INTERNATIONAL POROUS AND POWDER MATERIALS SYMPOSIUM, 3-6 September, Cesme-Turkey, 2013.

G. Kanaltı, Z. Traş, A. N. Olcay , M. Polat and H. Polat , Capture of low molecular weight organic contaminant within micelle structures in MEUF, PROCEEDING OF INTERNATIONAL POROUS AND POWDER MATERIALS SYMPOSIUM, 3-6 September, Cesme-Turkey, 2013.

M. Polat, H. Polat and U. Ipekoglu, Theory and Measurement of Interatomic forces and colloidal particles,7TH INTERNATIONAL INDUSTRIAL MATERIALS SYMPOSIUM AND EXHIBITION, 25-28 Feb., Kusadasi-Turkey, 2009. Invited paper.

B. Ülkü, M. Polat, H. Polat and K. Sekeroglu, Characterization of fly ashes and the aggregates produced from ash-waste mixtures. 11TH INTERNATIONAL MINERAL PROCESSING SYMPOSIUM, Antalya-Belek Turkey, 21-23 October, 2008.

S. Kelesoglu, M. Kes, D. Sen and H. Polat, Preparation and characterization of chitosan-TPP nanoparticles and their use for nickel(Ni²⁺)ion sorption.in Advances in Chitin Science Volume 10. edited by S. Senel, K.M. Varum, M.M. Sumnu and A.A. Hincal, PROCEEDING OF THE 8th INTERNATIONAL CONFERENCE OF THE EUROPEAN CHITIN SOCIETY 8-11 September 2007, Antalya, Turkey. pp.434-440, 2007.

D. Erdogan, H. Polat and U. Ipekoglu, Use of ion flotation to remove copper from waste waters.XXIII. INTERNATIONAL MINERAL PROCESSING CONGRESS, Eds. Guven Onal, Istanbul, Turkey, 3-8 September, 2006.

M. Molva, H. Polat and M. Polat, Removal of phenols from waste waters using lignitic coals. PROC. OF THE 10th INTERNATIONAL MINERAL PROCESSING SYMPOSIUM, Ed. A. Akar, U. İpekođlu, I. Cöcen ve M. Polat, Çeşme, Çeşme, Izmir Turkey, October, 763–770, 2004.

Sakar, Deliormanli and H. Polat, The role of mixed surfactant solutions on dispersion/flocculation behavior of alumina. PROCEEDINGS OF XTH INTERNATIONAL MINERAL PROCESSING SYMPOSIUM, Çeşme-Turkey, 5-7 October. 601-611, 2004.

H. Polat, M Polat and U. İpekođlu, Effect of some chemical and physical variables on flocculation and sediment behaviour. PROC. OF THE VIII. INT. MINERAL PROC. SYMP., Ed.: G. Ozbayoglu ve C. Hosten, 171, 2000.

H. Polat, M. Polat and S. Chander, Dispersion of oil in electrolyte solutions. PROC. OF THE XXI. INT. MINERAL PROC. CONG., Ed. P. Massacci, a5–137, Rome, 2000.

H. Polat, M. Polat and S Chander, Adsorption behavior of peo/ppo block co–polymers on coals of different rank. PROC. OF THE XXTH INT. MINERAL PROCESS CONG. –FLOTATION AND OTHER PHYSICO–CHEMICAL PROCESSES, ed. h. hoberg & h. von blottnitz, germany, 725, 1997.

S. Chander, H. Polat and M. Polat, Mechanism of coal flotation by insoluble collectors in the presence of peo/ppo block co–polymers. PROC. OF THE 6TH INT. MINERAL PROC. SYMP.–CHANGING SCOPES IN MINERAL PROC., Ed. M. Kemal Et al., A.A. Balkema, Rotterdam, 461, 1996.

G. Mitchel, A. Davis, H. Polat, and S. Chander, The Influence of photo-oxidation on the wettability of vitrinite from bituminous rank coals, PROC. 13TH ANNUAL INT. PITTSBURGH COAL CONF., Ed. H. S. Chiang, Vol. 2, 885, 1996.

S. Chander, H. Polat and M. Polat, High efficiency coal cleaning by a high shear treatment, FLOTATION PROCESS.PROC. OF THE HIGH EFFICIENCY COAL PREPARATION SYMP., SOC. OF MINING METALLURGY AND EXPLORATION, Littleton, CO, 197, 1995.

H. Polat, ve S. Chander, Improved efficieny of coal cleaning by a flotation-regrind-flotation process, Symposium on Fundamentals of Mineral Processing-Processing of Hydrophobic Minerals and Fine Coal, CANADIAN INST. OF MINING AND METALLURGY, 179-189, 1995.

H. Polat, Q. Hu, M. Polat and S. Chander, The effect of droplet and particle charge on dust suppression by wetting agents. PROC. OF THE VITH UNITED STATES MINE VENTILATION SYMP., Ed. R. Bhaskar, Soc. of Mining Metall. and Exploration, Littleton, CO, 535, 1993.

H. Polat, M. Polat and S. Chander, Characterization of coal slurries by electrokinetic sonic amplitude (ESA) technique. ELECTROACOUSTICS FOR CHARACTERIZATION OF PARTICULATES AND SUSPENSIONS, NIST Special Publication, Ed. G. Malgha, No. 856, 200, 1993.

Q. Hu, H. Polat and S. Chander, Effect of surfactants in dust control by water sprays. EMERGING PROCESS TECHNOLOGIES FOR A CLEANER ENVIRONMENT SYMP., Ed. S. Chander, Littleton, CO. SME. 269, 1992.

U. İpekođlu Uner & H. Polat Dewatering, Mineral Processing Hand Manual(in Turkish), Section 16. 2000.