

JOSEPH SABOL, Ph.D.
Chemical Consultant
Racine, Wisconsin USA
<https://chem-consult.com>

EDUCATION

Postdoctoral, Chemical Engineering, University of Minnesota, Minneapolis, MN
Ph.D., Chemistry, Oklahoma State University, Stillwater, OK
B.S., Chemistry, Carroll College, Waukesha, WI

EXPERTISE

Analytical chemistry, including identification of “unknown” materials.
Properties of industrial materials, corrosive gases and liquids.
Physical chemistry, thermodynamics, electrochemistry, reaction kinetics.
Materials chemistry, processing, physical properties, and performance analysis.
Metals and oxides, semiconductor materials, structure and property measurements.
Surface corrosion, cleaning, etching, and passivation.
OSHA regulatory compliance, including “Hazard Communication” and “Laboratory Standard.”
Technical staff training, laboratory design and instrument operation.
Industrial chemical market and feasibility research.

PROFESSIONAL EXPERIENCE

Chemical Consultant 1999 – Present
Selected list of projects, additional upon request

Automobile Parts, Polymer - North America Provided information on electromagnetic absorption and other physical properties, polymer blends, co-polymers, cross-linking, and additives. ASTM test specifications were observed.

Metal Products, Stainless Steel - North America Developed methods to monitor corrosive etching bath composition, chemical analysis of trace metal ions, pH modeling and measurement of concentrated sulfuric and chromic acid solutions; technical staff training.

Automobile Parts, Composites - North America Identified “unknown” nuisance industrial adhesive by FT-IR spectroscopy.

Silicon Purification - North America Provided information on semiconductor purification and processing of silicon for downstream semiconductor wafers, passivation of metal coatings exposed to corrosive chlorosilane gas mixtures at 350 degrees Celsius.

Metal Products, Brass - North America Recommended changes in process conditions to avoid surface oxidation of brass, pickling solution chemistry.

Chemical Manufacturing - North America Analyzed product contamination issues by FT-IR spectroscopy and SEM electron microscopy.

Semiconductor Processing - North America Recommended conditions for cleaning and etching wafers during photoresist, modeled clean and etch bath (mixture of HF/NH₃/HCl/H₂O) chemistry, temperature dependence, Pourbaix diagrams, non-aqueous solvent systems.

Polyvinyl Alcohol - Asia Provided information on polyvinyl alcohol PVOH production and downstream uses.

3-D Printing Materials - Asia Provided information on 2-D & 3-D advanced printing materials, specialty chemical technologies open and available for license, joint development, and/or investment: UV curable materials, high-performance ceramics, metal oxides and semiconductors, and multi-element/layer thin films.

Spot Test Paper - Asia Provided information to the client, desiring entry into the aqueous ion spot-test market: chemistry of dyes and other suitable indicator substances, papermaking, and incorporating indicators into paper products.

Biochemicals - Europe Provided information to a European manufacturer of specialty biochemical, assistance on entity formation, government regulations, and physical plant, warehouse, and distribution/shipping facility in North America.

Polymers - Europe Provided whitepapers on various subjects at client's request.

Testing Laboratory - North America Developed testing methodology for measuring ppm and ppb corrosive gases via mass spectrometry.

University Faculty, Analytical and Physical Chemistry

1987 – 2007

Instructor: Chemical equilibria, laboratory analysis, thermodynamics, spectroscopy and HPLC and GC chromatography, laboratory safety.

Research: Photochemistry, magnetic materials, transport properties, single crystal metal oxide crystal growth, electron microprobe analysis EMPA.

PROFESSIONAL AFFILIATIONS

American Chemical Society, Fellow
American Physical Society, Member
Materials Research Society, Member
American Institute of Chemical Engineers, Member
Sigma Xi Research Honorary, Life Member
County Emergency Planning Committee, Chair

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