

DENNIS W. BRINKMAN, PhD

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CAREER SUMMARY

Experienced research chemist and educator. Known for leading efficient, yet successful development projects that meet or exceed objectives. Expertise in the areas of environmental and energy research as well as the analysis of difficult materials. Knowledgeable in such diverse subjects as pollution prevention, waste minimization, environmental analysis, used hydrocarbons recycling, laboratory quality control, fuel stability, and synthetic crude processing.

WORK EXPERIENCE

INDIANA WESLEYAN UNIVERSITY (Marion, IN) 2000-Present
Professor, Chemistry 2006 - Present
Associate Professor, Chemistry 2000 - 2006

Prepare and teach lecture courses and laboratories related to all levels of undergraduate chemistry courses including General Chemistry, Analytical Chemistry, and Environmental Chemistry. Current research interests are focused on preparation of an analytical chemistry laboratory manual for publication.

SAFETY-KLEEN CORP. (Chicago) Environmental Services 1988-2000
Manager, Technical Development

Managed multiple teams working on hardware and chemistry development projects that supported a wide variety of lines of business such as industrial parts washing, silver recovery from photoimaging wastes, and used oil re-refining. Served as key technical liaison within the company and with technical associations. Also served as witness in litigation.

NATIONAL INSTITUTE FOR PETROLEUM AND ENERGY RESEARCH 1983-1988
(Bartlesville, OK) Not-for-profit Research Institute
Manager, Process and Thermodynamics Research 1985 - 1988
Senior Chemist 1983 - 1985

Managed multiple research teams of 10-25 technical professionals in both basic and applied research related to the energy industry as they successfully made the transition from federal government employees to contract research staff.

U. S. DEPARTMENT OF ENERGY/ **1976 - 1983**
BARTLESVILLE (OK) ENERGY TECHNOLOGY CENTER Energy Research
Project Manager, Processing Chemistry Research 1981 - 1983
Project Leader 1978 - 1981
Research Chemist 1976 - 1978

Led research team that had the primary role within the federal government on used oil recycling, chairing the interagency task force that coordinated all government efforts, while also leading group performing pioneering research in fuel stability and odorants for fuel safety.

PROFESSIONAL ACCOMPLISHMENTS

Published over 100 technical papers and made 200 oral presentations over the past 25 years, resulting in an international reputation as a leading authority in used oil recycling and hazardous waste management. Listing of key publications attached.

Chaired ASTM Subcommittee on Recycled Petroleum Products for over ten years, during which time new international standards on lubricant base oils and used oil fuel specifications were developed.

Served on American Petroleum Institute Used Oil Task Force, helping to enhance the perception of re-refined lubricating oil, thus increasing its market value.

EDUCATION

PhD	Analytical Chemistry	University of Michigan
BS	Chemistry	Ottawa (KS) University

Dr. Dennis W. Brinkman

PUBLICATIONS

While some of the over 100 technical papers published are proprietary, those in the open literature include the following:

1. Holcombe, J. A., D. W. Brinkman, and R. D. Sacks. Fortran-Based Photographic Emulsion Calibration Procedure for Use in Quantitative Spectrometry. *Anal. Chem.*, v. 47, 1975, p. 441.
2. Brinkman, D. W., and R. D. Sacks. Exploding Wires as an Intense Ultraviolet Continuum Excitation Source with Preliminary Application to Atomic Fluorescence Spectrometry. *Anal. Chem.*, v. 47, 1975, p. 1,279.
3. Brinkman, D. W., and R. D. Sacks. Simple, Inexpensive Monochromator Modification Permitting Dual-Channel Operation. *Anal. Chem.*, v. 47, 1975, p. 1,723.
4. Whisman, M. L., J. W. Reynolds, J. W. Goetzinger, F. O. Cotton, and D. W. Brinkman. Re-refining Makes Quality Oils. *Hydrocarbon Processing*, v. 57, 1978, p. 141.
5. Brinkman, D. W., F. O. Cotton, and M. L. Whisman. Solvent Treatment of Used Lubricating Oil to Remove Coking and Fouling Precursors. *BETC/RI-78/20*, 1978, 29 pp.
6. Brinkman, D. W., M. L. Whisman, and J. N. Bowden. Stability Characteristics of Hydrocarbon Fuels from Alternative Source. *BETC/RI-78/23*, 1979, 36 pp.
7. Brinkman, D. W., M. L. Whisman, J. W. Goetzinger. Trace Metal Analysis of Petroleum, Petroleum Products, and Alternative Fuels by Atomic Fluorescence/Emission Spectrometry. *Appl. Spectroscopy*, v. 33, 1979, p. 245.
8. Reynolds, J. W., D. W. Brinkman, and M. L. Whisman. Clay-Contacting Re-refined Lubricating Oils: A Parameter Study. *BETC/RI-79/5*, 1979, 12 pp.
9. Steele, G. L., D. W. Brinkman, and M. L. Whisman. Predictive Test Method for Coking and Fouling Tendency of Used Lubricating Oil. *BETC/RI-79/7*, 1979, 12 pp.
10. Whisman, M. L., D. W. Brinkman, J. W. Reynolds, J. W. Goetzinger, and F. O. Cotton. From Oil: Oil. *Chemtech*, October 1979, p. 628.
11. Cotton, F. O., D. W. Brinkman, J. W. Reynolds, J. W. Goetzinger, and M. L. Whisman. Pilot-Scale Used Oil Re-refining Using a Solvent Treatment/Distillation Process. *BETC/RI-79/14*, 1980, 40 pp.
12. Brinkman, D. W., J. N. Bowden, and H. N. Giles. Crude Oil and Finished Fuel Storage Stability: An Annotated Review. *DOE/BETC/RI-79/13*, 1980, 73 pp.
13. Brinkman, D. W., and E. W. White. Future Distillate Fuels: What, When, Where, and How Stable? *Distillate Fuel Stability & Cleanliness*, Leo Stavinocha and Cy Henry (eds.), ASTM Publications, 1981.
14. Bowden J. N., and D. W. Brinkman. Stability of Alternate Fuels. *Hydrocarbon Processing*, v. 59, 1980, p. 77.
15. Steele, G., D. W. Brinkman, and M. L. Whisman. Predictive Test Method for Coking and Fouling Tendency of Used Lubricating Oil. *Proceeding: Joint Conference on Measurements and Standards for Recycled Oil/Systems Performance and Durability*, Don Becker (ed.), National Bureau of Standards, 1980, p. 221.

16. Brinkman, D. W., J. N. Bowden, J. W. Frankenfeld, and W. F. Taylor. Synfuel Stability: Degradation Mechanisms and Actual Findings. Oil Shale, Tar Sands, and Related Materials. H. C. Stauffer (ed.), ACS Symposium Series No. 163, 1981, p. 297-313.
17. Brinkman, D. W. Re-refinery By-product Utilization and Waste Disposal. Used Oil: The Hidden Asset, Assoc. of Petrol. Re-refiners, Wash. DC, 1982, p. 165.
18. Brinkman, D. W. Re-refining vs. Burning: How Do You Decide? Used Oil: The Hidden Asset, Assoc. of Petrol. Re-refiners, Wash., DC, 1982, p. 226.
19. Brinkman, D. W. (ed.). Fuels/Engines Interface Research: Edited Workshop Proceeding. DOE/CONF-8109137, July 1982, 94 pp.
20. Brinkman, D. W., M. J. Gottlieb, and K. A. Koebel. Used Motor Oil Poses Environmental Problems. Oil & Gas J., Aug. 9, 1982, p. 163.
21. Brinkman, D. W., and J. N. Bowden. Stability of Some Syncrudes from Coal and Tar Sands. Fuel, v. 61, 1982, p. 1141.
22. Frankenfeld, J. W., W. F. Taylor, and D. W. Brinkman. Storage Stability of Synfuels from Oil Shale: I. General Findings, II. Effects of Nitrogen Compound Type and the Influence of Other Non-hydrocarbons, and III. Studies with Actual Shale-Derived Middle Distillate. Ind. and Eng. Chem., Product R&D, v. 22, 1983, p. 608.
23. Brinkman, D. W. Waste Petroleum Reclamation and Reuse. Proceeding: Industry-Military Energy Symposium, San Antonio, TX, 1981, p. 297-307.
24. Whisman, M. L., J. W. Goetzinger, F. O. Cotton, D. W. Brinkman, and C. J. Thompson. A New Look at Odorization Levels for Propane Gas. BERC/RI-77/1, 1977, 92 pp.
25. Goetzinger, J. W., D. W. Brinkman, B. E. Poling, and M. L. Whisman. Vapor-Liquid Equilibrium Data of Ethanethiol and Tetrahydrothiophene in Propane. J. of Chem. & Eng. Data, v. 22, 1977, p. 396.
26. Brinkman, D. W., J. W. Goetzinger, F. O. Cotton, and M. L. Whisman. Human Evaluations of Warning Odorants in Propane. Institute of Gas Technology Symp. on Odorization, Chicago, Ill., Aug. 18-21, 1980, pp. 227-240.
27. Whisman, M. L., J. W. Goetzinger, F. O. Cotton, and D. W. Brinkman. Odorant Evaluation: A Study of Ethanethiol and Tetrahydrothiophene as Warning Agents in Propane. Environment Science & Technology, v. 12, No. 12, November 1978, pp. 1285-1288.
28. Brinkman, D. W., M. L. Whisman, N. J. Weinstein, and H. R. Emmerson. Environmental, Resource Conservation, and Economic Aspects of Used Oil Recycling. DOE/BETC/RI-80/11, 1981, 59 pp.
29. Reynolds, J. W., and D. W. Brinkman. Application of the BETC Re-refining Technology to Some State of the Art Commercial Lube Oils. DOE/BETC/RI-31/1, 1981, 18 pp.
30. Brinkman, D. W., and M. J. Reilly (eds.). Design Properties of Coal Liquids: Edited Workshop Proceedings. CONF-810381, 1981, 166 pp.
31. Thompson, C. J., and D. W. Brinkman. Energy Saving by Re-refining Used Oils. Chapter in Recycling of Used Oils, D. Reidel Publishing Co., 1982, p. 253.
32. Reynolds, J. W., J. W. Goetzinger, F. O. Cotton, D. W. Brinkman, and M. L. Whisman. A Closed Loop Study of the Effects of Multicycle Re-refining of Automotive Lubricating Oil. DOE/BETC/RI-81/9, 1982, 33 pp.

33. Brinkman, D. W., K. D. Weinstein, and S. R. Craft. Utilization of By-products from Used Oil Re-refining. *Energy Progress*, v. 3, No. 1, 1983, p. 44.
34. Goetzinger, J. W., C. J. Thompson, and D. W. Brinkman, "A Review of Storage Stability Characteristics of Hydrocarbon Fuels, 1952-1982", DOE/BETC/IC-83/8, 1983, 297 pp.
35. Sundaram, T. R., and D. W. Brinkman. Long-term Mixing of Two Crude Oils Across a Horizontal Interface. *Energy Progress*, v. 4, 1984, p. 88.
36. Brinkman, D. W. Used Oil Recycling: State-of-the-Art. *Resource Recycling*, v. 3, 1984, p. 16.
37. Brinkman, D. W., and M. L. Whisman. Recovery of Naval Distillate Fuel from Reclaimed Product. Vol. 1: Technical Discussion. DOE/BC/10823-3, 1984, 179 pp.
38. Brinkman, D. W., F. O. Cotton, and M. Olson. Naval Distillate Fuel from Reclaimed Product. Vol. 2: Literature Review. DOE/BC/10823-3, 1984, 345 pp.
39. Brinkman, D. W., P. Fennelly, and N. Surprenant, "The Fate of Hazardous Waste in Used Oil Recycling," NBS Special Publication 674, Proceeding: Conference on Measurements and Standards for Recycled Oil - IV, July 1984, p. 13.
40. Brinkman, D. W. Used Oil: Resource or Pollutant? *Technology Review*, v. 88, 1985, p. 46.
41. Wells, J. W., and D. W. Brinkman. Recovery of Naval Distillate Fuel from Waste Marine Diesel Fuel. SAE Paper No. 851233, 1985.
42. Tai, W.-P., F. O. Cotton, K. Q. Stirling, and D. W. Brinkman. A bibliographical Review of Supercritical Extraction of Heavy Oils. NIPER-57, 1985, 225 pp.
43. Goetzinger, J. W., F. O. Cotton, D. W. Brinkman, and R. P. Anderson. Stability and Compatibility of Fuel Oils: Literature Review. NIPER-60, 1985, 210 pp.
44. Wells, J. W., D. W. Brinkman, "Stability Aspects of the Recovery of Navy Distillate Fuel from Reclaimed Product Project," DOE Report NIPER-78 (NTIS-DE86000261), 1985, 14 pp.
45. Anderson, R. P., J. W. Goetzinger, and D. W. Brinkman. Storage Stability and Compatibility of Heavy Fuel Oils. Topical Report No. NIPER-65, December 1985.
46. Bhan, O. K., D. W. Brinkman, J. B. Green, R. D. Grigsby, G. P. Sturm, and S. Y. Tang. Color Change/Sediment Formation in Marine Diesel Fuels. Task II. NIPER Report No. B06710-2, January 1986.
47. Brinkman, D. W., "Waste Hydrocarbons Recycling," *Chemical Eng. Progress*, March 1986, pp. 67-70.
48. Bhan, O. K., W.-P. Tai, and D. W. Brinkman, "Catalytic Upgrading of Used Lubricating Oils," *Fuel Science and Technology*, v. 4, No. 3, 1986, p. 303.
49. Bhan, O. K., D. W. Brinkman, and S. Y. Tang. Filtration Time in Jet Fuels. Task III. NIPER Report No. B06710-3, May 1986.
50. Anderson, R. P., J. W. Goetzinger, J. W. Reynolds, and D. W. Brinkman. Storage Stability and Compatibility of Residual Fuel Oils. Status Report No. NIPER-191, September 1986.
51. Brinkman, D. W., and K. Q. Stirling. Stability, Compatibility, and Related Problems of Additives in Navy Distillate Fuels Derived from Lower Quality Feedstocks. Second Annual Report, NIPER-222, December 1986.

52. Bhan, O. K., and D. W. Brinkman. Enhanced Fuel Particulates Determination. Phase I. Background Study. Report No. NIPER-241, March 1987.
53. Anderson, R. P., J. W. Goetzinger, J. W. Reynolds, D. W. Brinkman. Stability and Compatibility of Residual Fuel Oils. Topical Report No. NIPER-245, April 1987.
54. Bhan, O. K., J. B. Green, and D. W. Brinkman. Chemistry of Hydrotreating Heavy Crudes: I. Compositional Changes in Wilmington 650-1000°F Fraction with Severity of Hydrotreating. Presentation at the American Chemical Society Symposium on Advances in Hydrotreating, Denver, Colo., April 5-10, 1987.
55. Brinkman, D. W. Technologies for Re-Refining Used Lubricating Oil. J. Amer. Soc. Lubrication Engineers, May 1987, pp. 324-328.
56. Wells, J., D. W. Brinkman, and K. Q. Stirling. Groundwater Contamination from Refinery Operations. Final Report NIPER-274, September 1987.
57. Wells, J. W., and D. W. Brinkman. Hydrocarbon Contamination of Groundwater: Research Needs. NIPER-275, September 1987.
58. Wells, J. W., E. J. Zagula, D. W. Brinkman, and R. P. Anderson. Catalytic Cracking of Mayan Gas Oil and Selected Hydrotreated Products. Topical Report NIPER-280, September 1987.
59. Sutterfield, F. D., D. W. Brinkman, W. D. Good, R. P. Anderson, and J. W. Wells. Understanding the Chemistry Relating Heavy Crude Feedstock with Product Slate and Quality. Topical Report NIPER-285, September 1987.
60. Brinkman, D. W., Large Grassroots Lube Re-refinery in Operation, Oil & Gas J., Aug. 19, 1991, pp. 60.
61. Pyziak, T., D. W. Brinkman, Recycling and Re-refining Used Lubricating Oils, J. Soc. Tribologists and Lubrication Engr., May, 1993, pp. 339-346.
62. Brinkman, D. W., R. M. SanJulian, Recycling of Fluids and Other Materials from Off-Highway Operations, SAE Technical Paper Series 932449, 1993.
63. Brinkman, D. W., J. R. Dickson, Contaminants in Used Lubricating Oils and Their Fate during Distillation/Hydrotreatment Re-refining, Environmental Science & Technology, v.29(1), p. 81-86.
64. Brinkman, D. W., J. R. Dickson, D. Wilkinson, Full-Scale Hydrotreatment of Polychlorinated Biphenyls in the Presence of Used Lubricating Oils, Environmental Science & Technology, v.29(1), p. 87-91.
65. Dickson, J. R., D. W. Brinkman, G. R. Blackburn, Evaluation of the Dermal Carcinogenic Potential of Re-refined Base Stocks Using the Modified Ames Assay, PAC Analysis and the 32P-Postlabeling Assay for DNA Adduct Induction, J. Appl. Toxicology, Vol 17(2), pp. 113-117.
66. Ihms, E. C. and D. W. Brinkman, Thermogravimetric Analysis as a Polymer Identification Technique for Forensic Applications, J. Forensic Science, 49(3), pp. 505-510.
67. Brinkman, D. W. and B. J. Parry, "Oil Recycling", Kirk-Othmer Encyclopedia of Chemical Technology, 2005.
68. Brinkman, D. W. and B. J. Parry, "Used Oil Recycling and Environmental Considerations," Chapter 37 of Handbook of Lubrication and Tribology, Vol 1. Application and Maintenance (2nd Edition), George E. Totten, Editor, Taylor & Francis Group, 2006.
69. Brinkman, D. W. and B. J. Parry, "Oil Recycling", Encyclopedia of Chemical Technology, Concise, 5th Edition, 2007.
70. Brinkman, D. W. and B. J. Parry, "Used Oil Recycling and Environmental Considerations," Chapter 10 of Lubrication and Maintenance of Industrial

Machinery: Best Practics and Reliability, Robert M. Gresham & George E. Totten, Editors, CRC Press/Taylor & Francis Group, 2009 (p. 10-1 to 10-14).

In addition to the above, Dr. Brinkman has made over 150 oral technical presentations to local, national, and international conferences, workshops, and seminars.