Course Contents
Synthetic Lubricants 203: Non-Petroleum Fluids and Their Uses
STLE Annual Meeting 2012

Course Chairman: Sandra Walker, Dow Corning Corporation, Auburn, MI
Course Vice Chairman: Beth Winsett, ExxonMobil Chemical Company, Baytown, TX

Ms. Walker is an Application/Technical Service Engineer with Dow Corning and is based in Auburn, MI. She is a project leader and involved in product development and technical support for Molykote Lubricants. Sandy has a Bachelor of Science degree in Education from the University of Kansas. She has worked in Research and Development for 11 years; first developing automotive coatings and later developing solid lubricant technologies for industrial and automotive applications.

Beth is a Staff Chemist with the Synthetics Division at ExxonMobil Chemical Company. Her first 11 years in corporate research were focused on synthetic lubricants and related products. She is currently responsible for new product development and manufacturing support of Alkylated Aromatic lubricants and other Group V fluids. She received a B.S. degree in Chemistry from Southern Illinois University at Carbondale and a Ph.D. degree in organic chemistry at Northwestern University.

This course is designed primarily for formulators and users of lubricating materials. This course provides an overview of non-petroleum based lubricants, their comparison to each other and to petroleum oil. Each section covers the chemistry, strength and weaknesses of each material and basic application.

INTRODUCTION TO SYNTHETIC FLUIDS presented by Stephen C. Lakes, Cognis Corporation, Cincinnati, OH

This presentation is an introduction and overview to the API Base-stock classification system and to the non-petroleum fluids currently in use in the lubrication industry worldwide.

POLYGLYCOLS presented by Martin Greaves, Dow Chemical Corporation, Zurich, Switzerland

This presentation will briefly review the chemistry of PAGs, and emphasize the properties and applications of polyalkylene glycols in industrial lubrication.

SILICONES presented by Sandra Walker, Dow Corning Corporation, Auburn, MI

The detailed chemistry, properties and formulation applications of silicone fluids will be described in this presentation.

POLYALPHAOLEFINS presented by Cindy French, Chevron Phillips Chemical Company, The Woodlands, TX

Cindy French is the Polyalphaolefins Product Manager for Chevron Phillips Chemical Company LP, a position she has held since 2004. Cindy was born in Michigan and graduated from The University of Michigan in 1978 with a degree in geology. She then earned a Master of Science degree in low temperature aqueous geochemistry at Virginia Polytechnic Institute. In 1983 Cindy began her professional career in petroleum exploration and production at Chevron USA in New Orleans, LA. After transferring to Houston, an opportunity in Chevron Chemical related to oil-field chemicals lured Cindy away from seismic lines, well logs, and subsurface mapping. Since 1992, Cindy has worked in several different specialty product lines at Chevron Chemical as account
This presentation will provide background on what Polyalphaolefins are with specific emphasis on their physical and chemical properties. Comparisons of their properties versus other synthetics and mineral fluids will be covered. Also, a brief review of the manufacturing process, market application, and a general supply/demand overview will be made.

**ESTERS** presented by Gene R. Zehler, BASF Corporation, Cincinnati, OH

Gene Zehler is a Technical Service Manager and Research Project Leader with the Lubricant Solutions Division of BASF Corporation. He has been developing and supporting synthetic lubricants since 1981. Gene received his Bachelor and Master of Science degrees in Chemistry from the University of Cincinnati. He is a member of STLE, NLGI, SAE, ACS and ASTM.

This presentation will review the chemistry, properties, and typical lubricant applications of organic ester base stocks. Various classes of organic esters will be discussed, including diesters, polyol esters, dimer esters, aromatic esters and monoesters.

**FLUOROCARBONS** presented by Greg Bell, DuPont Chemicals, Wilmington, DE

Mr. Bell is a Technical Service Associate with DuPont Chemicals and Fluoroproducts, Performance Lubricants. He joined DuPont in 1974 with a Bachelor of Engineering degree in Mechanical Engineering from Youngstown State, Youngstown, Ohio. His background includes assignments in R&D, production, safety, and maintenance. He is responsible for technical service and product development for Krytox Performance Lubricants. He is a member of the National Lubricating Grease Institute, The Society of Tribologists and Lubrication Engineers, and the Society of Mechanical Engineers.

This presentation will cover the chemistry, properties and applications for fluorocarbon fluids in use in the lubricant area.

**ALKYLATED AROMATICS** presented by Beth Winsett, ExxonMobil Chemical Company, Baytown, TX

This presentation will cover the chemistry, properties and applications for alkylbenzenes, alkynaphthalenes and other alkylated aromatics for in use in the lubricant area.

**PHOSPHATES** presented by W. David Phillips, Consultant, Stockport, Cheshire, UK

David Phillips joined the Geigy Company in 1964 after graduating in chemistry from the University of Manchester. He worked on the development of synthetic lubricants, fire-resistant hydraulic fluids and oil additives before moving into technical marketing and market support role for Ciba-Geigy on the same product groups. He remained in technical marketing through the transition to FMC Corporation in 1992 and to Great Lakes Chemical Corp. in 1999. His last position was as the Technical and Marketing Manager for the Performance Additives Business of Great Lakes. He ‘retired’ in 2005 but is currently working as an independent consultant. He is the chairman of the UK national committee on hydraulic fluids and the past chair of the European Hydraulic Fluids Committee. He was made an STLE Fellow in 2006.

This portion of the course will review the manufacture, chemistry and properties of the different phosphate ester types used as fire-resistant fluids and lubricants and as antiwear and extreme pressure additives for both mineral oil and synthetic base stocks.