



Harry G. Fair

Each year, a special lecture is given in memory of Harry G. Fair, an outstanding OU alumnus. Harry G. Fair was born in Okmulgee, Oklahoma, on June 3, 1916. He received his B.S. in Chemical Engineering in 1939. He joined Phillips Petroleum Company in 1939 and worked his way up to Vice President for Supply and Transportation, with responsibility for world-wide exchange of crude oil and all transportation facilities. In 1966, he joined the M.W. Kellogg Company as Executive Vice President, in charge of all engineering activities and became Executive Vice President of Coastal States Gas Corporation from 1971 until the time of his death on July 27, 1974. Harry G. Fair was active in service to society and to his alma mater. He was a member of a number of professional societies and was a licensed professional engineer.

This lecture is made possible by the Harry G. Fair Memorial Fund contributed by his widow, Jane Swift Fair. Arrangements are made by the School of Chemical Engineering and Materials Science.

"Compatibilization of Polymer Blends"

by

Christopher W. Macosko

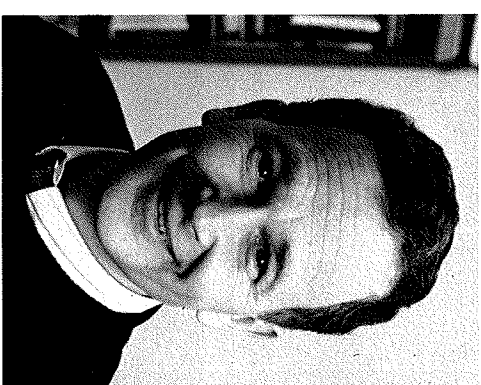
Professor, Department of Chemical Engineering and Materials Science, Institute of Technology, University of Minnesota

Polymer blends are the fastest growing area of the plastics market. Most blends are made by mixing two or more immiscible polymers in the molten state. Their multiphase structure must be stabilized to prevent coalescence when the blend is extruded or molded by a polymer processor. The main method of compatibilization is to use a block copolymer which can act like a polymeric soap to stabilize the morphology. This block copolymer can be premade and compounded into the mixture or it can be formed in situ by coupling reactions between the two different chains.

We have studied blends of polystyrene and poly-methyl methacrylate which can be compatibilized by premade block copolymers, or reactively formed graft or diblock copolymers. Premade diblocks are much less effective than the reactively formed copolymers. Surface coverage of 20% by block copolymers seems to be sufficient which can mean < 2% block copolymer. Molecular weight effects are significant. Results from small mixers will be compared to that for twin screw extruders.

Christopher W. Macosko is a professor of Chemical Engineering and Materials Science at the University of Minnesota and founder and consultant to Rheometrics, Inc., both since 1970. His research efforts, in the area of polymer processing, include development and testing of models for processes that involve network polymerization (such as electronics encapsulation), fiber-reinforced composites, interfacial reaction during polymer blending, and polymerization with phase separation (for example, formation of polyurethane block copolymers by reaction injection molding). He is also interested in coating flows of non-Newtonian fluids, new rheological test methods and constitutive equations.

Macosko's work in these areas has resulted in more than 100 research papers, 5 U.S. patents, 60 M.S. and Ph.D. theses under his



Christopher W. Macosko

advice, and two books, *Film, Fundamentals of Reaction Injection Molding*, Hanser, New York (1989) and *Rheology: Principles, Measurements and Applications*, VCH, Poughkeepsie, NY (1994). In addition, it has earned for him a number of awards including "best paper" awards from the Thermoset Division of the Society of Plastics Engineers Annual Technical Conferences in 1972 and 1981 and the Society of Plastics Industry, Composites Conference in 1987. He was named Minnesota Young Engineer of 1977 by the Society of Professional Engineers (Minnesota). In 1986, he received the Society of Plastics Engineers International Research Award, and in 1988, he received the Charles M.A. Stine Award in Materials, from the AIChE Materials Engineering and Sciences Division.

Prior to his current positions, Macosko was a member of the Plastics Processing Group, at Western Electric Engineering Research Center in Princeton New Jersey from 1968 to 1970. While at Minnesota, Macosko has served as Visiting Professor of Chemical Engineering at Princeton University (1978-'79), Visiting Professor of Macromolecular Science at Case Western Reserve (1983), Visiting Professor and CNRS Fellow, Universite Louis Pasteur, Strasbourg, France (1985-'86), Visiting Scientist at BASF's Polymer Physics Lab in Ludwigshafen, Germany and as visiting Professor and NSF Fellow at the Tokyo Institute of Technology (1992-'93).

He completed his BSChE at Carnegie-Mellon University in 1966, his MSChE at Imperial College in London in 1967 and his PhD at Princeton in 1970.

*You Are Cordially Invited
To Attend*

The 20th Annual

**Harry G. Fair
Memorial Lecture**

in

Chemical Engineering
And Materials Science

**April 21, 1994
3:30 P.M.**

*The Lecture will be given
on campus,
In Sarkeys Energy Center,
Room M-204*

Coffee and Refreshments
will be served

School of Chemical Engineering
& Materials Science
The University of Oklahoma
Sarkeys Energy Center
100 E. Boyd, Room T-335
Norman, Oklahoma 73019-0628

The University of Oklahoma
College of Engineering

The
20th
Annual

**Harry G. Fair
Memorial Lecture**

in



Chemical
Engineering

1994