

1985 Engineer of Distinction



Don E Ferguson

B.S. Chemistry, TPI, 1944

M.A. Mathematics and Chemistry, UT-Knoxville, 1946

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Citation

Don E. Ferguson received a baccalaureate degree from Tennessee Polytechnic Institute (now Tennessee Technological University) in 1944. He subsequently earned a master of arts degree from the University of Tennessee, Knoxville, in 1946, majoring in mathematics and chemistry. He has been at the Oak Ridge National Laboratory since 1948.

The large number of innovative contributions by Mr. Ferguson to the development of chemical processes for the nuclear fuel cycle, nuclear waste disposal, and transuranium element recovery eminently distinguish him. His specific contributions include development of the PUREX process and other chemical processes for reprocessing power reactor fuels, development of the Sol-Gel Process for uranium and thorium fuel material preparation, development of methods for disposal of radioactive wastes, and research and development leading to the design and operation of chemical plants for recovery of transplutonium elements.

These developments have worldwide importance. The PUREX process is used throughout the world for power reactor and plutonium production reactor processing, and the development of transuranium recovery processes have made possible much of the research leading to the fundamental understanding of the structure of the transuranium elements. His personal contributions to these developments have had major technical consequence.

Mr. Ferguson has made major contributions to the development, pilot plant demonstration, and economic appraisal of both aqueous and nonaqueous processes for spent nuclear fuel reprocessing. He was responsible for the early development of the process flowsheet and the subsequent development of the unit operations which made the process possible. He developed the Thorex process for the Th-²³³U fuel cycle, contributing to the flowsheet synthesis and unit operations' development. He directed the development of major nonaqueous processes which are potentially improved alternatives to the PUREX process. The major

processes in this category are the Fluidized-Bed Fluoride Volatility Process and the Molten Salt Volatility Process. He was a member of the working Group 4 of the International Nuclear Fuel Cycle Evaluation (INFCE) from February 1978 to July 1979.

He is a pioneer in developing and evaluating methods for disposal of wastes in salt repositories. He is co-inventor of an innovative process for removal and concentration of ^{85}Kr from the CO_2 produced in burning High-Temperature Gas-Cooled Reactor (HTGR) spent graphite fuel elements. He has influenced and contributed to the development of waste disposal by co-injection with cement into hydrofractured shale formations. He served on the National Research Council study of strategies for radioactive waste disposal in the United States.

Mr. Ferguson was the leader in the development of processes for and has guided the development of chemical processes for producing important nuclear materials for use in research and development. Under his guidance the Transuranium Processing Facility at the Oak Ridge National Laboratory has developed processes and operated successfully to isolate, purify, and ship unprecedented quantities of Cf, Bk, Es, and Fm to researchers throughout the world. These processes meet a number of severe criteria: they must allow quantitative recovery of extremely minute quantities of material and the processes must be simple enough to allow remote operation because of the associated radiation.

He was Director of the Chemical Technology Division of Oak Ridge National Laboratory from 1964 to 1983 and retains long-term membership in the U.S. Department of Energy Transplutonium Program Committee where he exerts influence commensurate with long experience in the field. He is a Fellow in the American Nuclear Society.

He is a member of the Church Street Methodist Church and has been active with the Boy Scouts of America.



Don and Wilma Ferguson pose with TTU President Arliss Roaden (left) and Dean Leighton Sissom