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Planetary Analysis

Chemical analysis, like any scientific endeavor, has its glamorous as well as its routine moments. Perhaps the most exciting challenges to compositional analysis have come from the exploration of outer space. For years, our chemical knowledge of the universe was limited to the analysis of meteorites that had fallen on Earth, commonly referred to as the "poor man's space probe." The 1960s and 1970s saw dramatic advances produced by exploration of the moon. Analysis of soil and rock samples returned to Earth by the U.S. Apollo Lunar Missions and remote analyses by the Soviet Luna Experiments contributed valuable new information. Since then, persistent efforts have been made to explore the solar planets.

We are very fortunate to publish in this month's INSTRUMENTATION a description of the latest development in this exotic field, the X-ray fluorescence spectrometric analysis of the surface of Venus by the Soviet Venera 13 and 14 probes. Since 1962 a series of U.S. Mariner and Soviet Venera fly-by and impact missions has studied the planet Venus. The only previous analyses of the surface chemistry of Venus, conducted by earlier Veneras, had been by gamma-ray spectroscopy, which measured the presence of radioactive uranium, potassium, and thorium but took no actual sample and could give no elemental analyses.

On March 1 and 5 of this year, however, Veneras 13 and 14 touched down on the planet and provided the first detailed analysis of Venusian surface rocks. We are particularly indebted to Professor Yu. A. Surkov and his colleagues at the Vernadsky Institute of Geochemistry and Analytical Chemistry in Moscow for their cooperation in sharing with our readers the details of one of the more exciting analytical measurements of recent time.

