

Soviet results on chemistry of Venus

The sun and the planets are supposed to have condensed out of a nebula some 4 billion or so years ago. Such, at least, is the most widely heard theoretical suggestion nowadays. The question of origin is probably the most fundamental in planetology and one of the most difficult. Detailed information about the elemental composition and chemical histories of the planets one by one will be needed to show whether such a primordial nebula could have existed and whether its composition was uniform or not.

Preliminary results from the recently landed Soviet Venus probes, Venera 13 and 14, give information that will help develop such a history for Venus. The information was reported by one of the researchers involved, V. I. Moroz, at this week's COSPAR XXIV, the 24th meeting of the International Council of Scientific Unions' Committee of Space Research in Ottawa. One piece of new information concerns the level in the Venus atmosphere at which ultraviolet light from the sun is absorbed. Other data refer to the amounts of certain noble gases and certain rare chemical compounds in the Venus atmosphere.

Venus looks yellowish to ground-based observation. This is because somewhere over the planet the blue to ultraviolet range of sunlight is absorbed. Before the latest Venera landings, says Moroz, planetologists "didn't know at what level the ultraviolet is absorbed." The experiments aboard these probes have found, he said, that 90 percent of the ultraviolet is absorbed above 60 kilometers from the surface. This corresponds more or less to the upper layer of the Venus clouds, which extends from about 55 to 70 km with an overlying haze.

The noble gases are called noble because they have an almost total resistance to chemical compounding. Thus their proportions in a planetary atmosphere are likely to remain relatively stable for a long period. They are, as Moroz told SCIENCE NEWS, an important clue to "how the atmosphere was created 4 or 5 billion years ago."

The recent Venera results put new limits on the proportions of krypton and xenon in the Venus atmosphere, indicating the amounts of both gases to lie between 30 and 100 parts per billion. The ratio of two isotopes of neon, neon 20 to neon 22, is determined to be 11.9 ± 0.7 . Comparing this figure with those for other planets may give information of the composition and perhaps the nuclear physics history of the primal nebula, when the comparisons are theoretically interpreted. The Venus figure happens to be larger than the ratio for earth, which is 10.07 ± 0.35 , and smaller than that for the sun, which is 13.6.

The proportions of trace compounds

Chemical formula	Name of formula	Number
Molecular hydrogen	H ₂	25 ± 10 ppm
Molecular oxygen	O ₂	18 ± 4 ppb
Water	H ₂ O	700 ± 300 ppm
Hydrogen sulfide	H ₂ S	81 ± 40 ppm
Carbonyl sulfide	COS	40 ± 20 ppm
Sulfur hexafluoride	SF ₆	200 ± 100 ppb

are data to go into a chemical history of the planets. As Moroz says, "We don't understand what are the reactions between small components and the surface." As a contribution to the development of such understanding, the latest Veneras have measured several trace compounds, some for the first time.

A question was raised privately whether one of them, sulfur hexafluoride, which is an industrial product, had not possibly been generated somewhere inside the spacecraft itself. Moroz replied that the researchers had considered such a possibility and had ruled it out. —D.E. Thomsen

U.N. holds global environment meeting

An eight-day special session of the United Nations Environment Programme (UNEP), commemorating the 10th anniversary of the United Nations Conference on the Human Environment, concluded in Nairobi, Kenya last week with 105 nations reaffirming their "commitment to the Stockholm Declaration and Action Plan" adopted at that earlier meeting. In contrast to the spirited Stockholm conference — which created UNEP and, many say, a first global environmental consciousness — the Nairobi conference was described by several participants as "flat" and "not very exciting."

"The years since [Stockholm] have witnessed significant progress," reads a declaration adopted by consensus of all participants at the end of the meeting. But "the Action Plan has only been partially implemented and the results cannot be considered satisfactory." One reason for this failure, cited in the declaration, has been a reduced commitment of resources toward solving global environmental problems on the part of wealthier nations that took the lead in Stockholm, including the United States. This is partially due to a change in world economic conditions between 1972 and 1982, according to one member of the U.S. delegation.

Another reason for a reduced U.S. commitment, said some participants, is a change in policy by the Reagan administration. Both a perceived lack of attention to domestic environmental problems (SN: 4/10/82, p. 246) and an actual decrease in U.S. contributions to UNEP since Reagan took office make it seem to other countries that the U.S. has "abdicated" its leadership role, says Tom Stoel, director of International Programs for the Natural Resources

Defense Council. "As a result, the meeting suffered from a lack of leadership."

Since 1972, the U.S. had been contributing about \$10 million to UNEP each year. But in FY '82 the Reagan administration requested only \$2 million. Although that amount was increased to \$7.85 million by Congress, the administration would like to lower it again in FY '83. The lack of U.S. initiative at Nairobi was no surprise, says Stoel, who attended the conference. "They didn't expect anything and they didn't get anything from the U.S."

The reduced U.S. contribution to UNEP was simply "a result of severe budget cuts felt by almost all federal programs," argues William C. Salmon, senior advisor for science and technology in the Office of Undersecretary of State James L. Buckley. Buckley was one of three administration officials who headed the U.S. delegation to Nairobi. "The U.S. has no intent or desire to reduce its leadership role," Salmon told SCIENCE NEWS. Another delegation leader, A. Alan Hill, chairman of the Council on Environmental Quality, says that "the U.S. has carried over a third of the financial burden of UNEP for 10 years — we feel it's time that others pick up part of it."

The third leader of the U.S. delegation, Anne M. Gorsuch, administrator of the Environmental Protection Agency, addressed the conference on its opening day. She emphasized the Reagan administration's general conviction that workings of free market economics can solve many problems better than government regulation. "Many of our actions have failed to take advantage of the natural corrective measures that can work through market forces — if governments allow them to operate," she said. Her statement summarized U.S. actions on behalf of the environment over the last 10 years, but contained no new proposals.

Several developing nations, on the other hand, proposed strong actions on behalf of the global environment. This was a "real reversal from 10 years ago," Stoel said in an interview, when most representatives of developing countries were suspicious that environmental proposals were intended to keep them from attaining economic development. Most of the proposals at Nairobi, however, were accompanied by requests for increased financial assistance from developed nations. A central issue was the role of UNEP as either a project manager (and funding source) or simply a catalyst to national or bilateral action. In the end, the latter view — supported by the U.S. — won out.

Also included in the final declaration were two controversial provisions calling for "a new international economic order" and "an international atmosphere of peace and security, free from the threats of any war, especially nuclear war. . . ." These issues are "extraneous," says CEQ's Hill, and a conference on the global environment "was not the proper forum" for them.

—L. Tangley