



Grätzel postulates that the 8-hydroxyquinoline attaches to the semiconductor surface via  $\text{Ti}^{4+}$ .

Houilding, now of the Solar Energy Research Institute in Golden, Colo., feared that the metal-8-hydroxyquinoline complex might fall apart in solution; so she decided to check whether the 8-hydroxyquinoline alone in solution (that is, not complexed to a metal) could affect experimental results. "Then the surprise

came," Grätzel said: when the pure white 8-hydroxyquinoline was added to the pure white  $\text{TiO}_2$  particles, the two somehow formed a striking yellow-orange complex that absorbed more light and generated more hydrogen than did the  $\text{TiO}_2$  particles sensitized with the initially investigated metal complex.

Whereas  $\text{TiO}_2$  particles alone can only absorb light whose wavelengths are 400 nanometers or shorter, the latest sensitized particles can absorb wavelengths as long as 620 nanometers. Theoretically, harvesting more of the solar spectrum means generating more hydrogen. "But the big development in this research is that we have found a very cheap [metalless] and easy way to make a sensitizer [on the surface of the semiconductor]," Houilding says. Previous attempts to ensure that sensitizers not float randomly in solution, but rather remain close to the semiconductor so that they can easily inject their excited electrons, have involved complicated, multi-step processes. Says Grätzel, "We have a new strategy for sensitizing  $\text{TiO}_2$ ." —L. Garmon

## Keyword objects to APS nuclear stand

Back in January the council of the American Physical Society issued a statement about nuclear weapons on behalf of the society. At the time it got some notice in the press, but it did not seem a particularly startling document. The Reagan administration, however, took umbrage, and George A. Keyworth II, the President's science adviser, prepared a vehement statement, which has been published in the May *PHYSICS TODAY* along with a response by Robert E. Marshak, who is this year's president of the APS.

The APS council's statement urged negotiations among all nations to limit and reduce nuclear weapons, prevent their proliferation to more nations and keep them out of space. Keyworth argues that the statement is a political intervention that the APS council had no right to make, and that the nuclear freeze "is hardly nonpartisan [italics his]." Marshak responds that the statement is nonpartisan, did not take a stand on the nuclear freeze and that the APS council has made such statements on public policy on behalf of its membership before now. Keyworth suggests that the council is not representative of the members on this topic.

The question of partisanship may be a piece of sociological relativity. What looks like a centrist statement with "a balanced tone" to the APS president can look very partisan to those who think it dissents from their policy. Keyworth stresses Reagan's policy of negotiation from strength; the APS council urged negotiation "without preconditions and with a sense of urgency." Maybe that's the difference.

Marshak says the APS council attempted "a technically unflawed contribu-

tion." While the Roman Catholic bishops were negotiating the draft of their letter on the subject, the administration kept urging them to leave it to the experts. Now some of the experts have chosen to make an ethical statement. Keyworth points out that in this context ethical statements become political, and so they do. Keyworth believes that the APS council should not make such ethical-political statements. Other commentators seem to think that on the subject of nuclear weapons, the bishops should forgo their role as moral advisers. —D.E. Thomsen

## New center for museum collections

In perhaps the most unusual relocation in history, more than 6 million items from the Smithsonian Institution's museums will be moved to a conservation, storage, study and teaching facility just completed in Suitland, Md., 6 miles from downtown Washington. The new building, dedicated this week, was designed to safeguard the wide variety of specimens, from tiny beads and shells to totem poles and whale skeletons. The most space will be devoted to the overcrowded collections of the National Museum of Natural History.

"To our knowledge, no museum has embarked on a more comprehensive analysis of its needs, and none has reached so far into the technologies of industry to meet them," says the Smithsonian's Paul N. Perrot. Achievements of the new building include an environment optimal for preserving museum collections—70° F ( $\pm 2^\circ$ ), 50 percent humidity ( $\pm 2$  percent).

The Support Center, as it is called, has

## Another close-up comet

On May 7, mere days after comet IRAS-Araki-Alcock was discovered on its way to the closest earth flyby by any known comet since 1770 (SN: 5/14/83, p. 311), three Japanese observers discovered another comet heading for a near-earth pass. Named for its finders, comet Sugano-Saigusa-Fujikawa will come within 5.6 million miles of earth on June 12—about twice its predecessor's distance, but still among the closest cometary visitors of this century.

Meanwhile, researchers are beginning to analyze their hastily gathered data on IRAS-Araki-Alcock. Radar signals, for example, were successfully bounced off the comet's nucleus from the huge Arecibo radio telescope in Puerto Rico and the Goldstone, Calif., antenna of NASA's Deep-Space Tracking Network, which may allow calculations of its size, roughness and rotation rate. The International Ultraviolet Explorer satellite yielded spectra of molecular sulfur ( $\text{S}_2$ ), which Michael F. A'Hearn of the University of Maryland and Paul D. Feldman of Johns Hopkins University in Baltimore report to be the first ever detected in a comet and possibly "in any astronomical object." The comet is probably not atypical, says A'Hearn—spectra of its other components were "quite normal"—but the  $\text{S}_2$  was huddled within about 50 kilometers of the nucleus, so that only the close flyby made the detection possible. It has been assumed that two known cometary components—carbon monosulfide (CS) and atomic sulfur (S)—came from photodissociation of carbon disulfide ( $\text{CS}_2$ ), but A'Hearn says that the presence of  $\text{S}_2$  (presumably a source of some of the S) suggests this idea is "oversimplified." —J. Eberhart

an ultra-modern look. The storage area is composed of four "pods," each the size of a football field. Specially designed storage units will be stacked from floor to ceiling, accessible by suspended catwalks. Across a wide central hall from the pods are laboratories, offices and lecture rooms for museum conservation work and a training program scheduled to begin in 1984.

Special facilities in the dock area include a fumigation chamber large enough for a grand piano and a 7,000-gallon tank that can render whale skulls. A computer inventory will keep records on all the objects stored in the center, and strict security measures will be in effect.

The transfer of specimens from the museums will begin in early fall and is expected to take 3 years. Eventually the center will have 300 staff members. It will not be open to the public, but the collections will be accessible to scientists and scholars. —J.A. Miller