If the copper sulfate gel becomes exposed to the air it dries out and the experimenters see no x rays. Even with the proper amount of water the experiment is not reproducible; they see x rays only about 10% of the time.

Assuming the Utah group is seeing the copper Kα line at 8 keV, Michel Duguay of Bell Labs (who has been devoting considerable time to x-ray laser considerations) calculates that they would need a pumping power of about 10^{15} watts; the Utah group has only 1.5 gigawatts of pumping power, a million times too small. Kepros told us this is inaccurate. On focusing the intensity is 300 gigawatts/cm^2, he said.

Kepros, at the Rochester conference, proposed that a population inversion may be produced by a shielding effect whereby the oxygen K-absorption edge protects the copper L shell from depopulation by slow electrons. Fast electrons would not be significantly affected by the oxygen and could then remove the copper K-shell electrons, thus allowing the necessary population inversion.

Another possible explanation has been offered by Ray Elton of the Naval Research Laboratory, who has been observing intense x-ray emission coming from a small region in a plasma pinch. Elton and the Utah group feel that the mechanism for the anomalous, highly localized heating observed in the pinch may be similar to the mechanism that produces the high electron energy needed to cause the Utah laser to lase. Elton qualifies this suggestion, however, by noting that the Utah system is a liquid and it is not known whether or not the same kind of plasma conditions are formed when the gelatine system blows up as Elton gets in a two-electrode discharge. —GBL

Bell Labs experiments with auto-exhaust catalysts

In an attempt to understand the mechanism of catalysis a Bell Labs group has found a class of compounds that are good catalysts for the oxidation of carbon monoxide. The Bell group, Rudie Voorhoeve, Joseph Remeika, Paul Freeland and Bernd Matthias (also at the University of California, La Jolla), says[1] that the compounds are promising substitutes for platinum in devices for catalytically treating automobile exhaust.

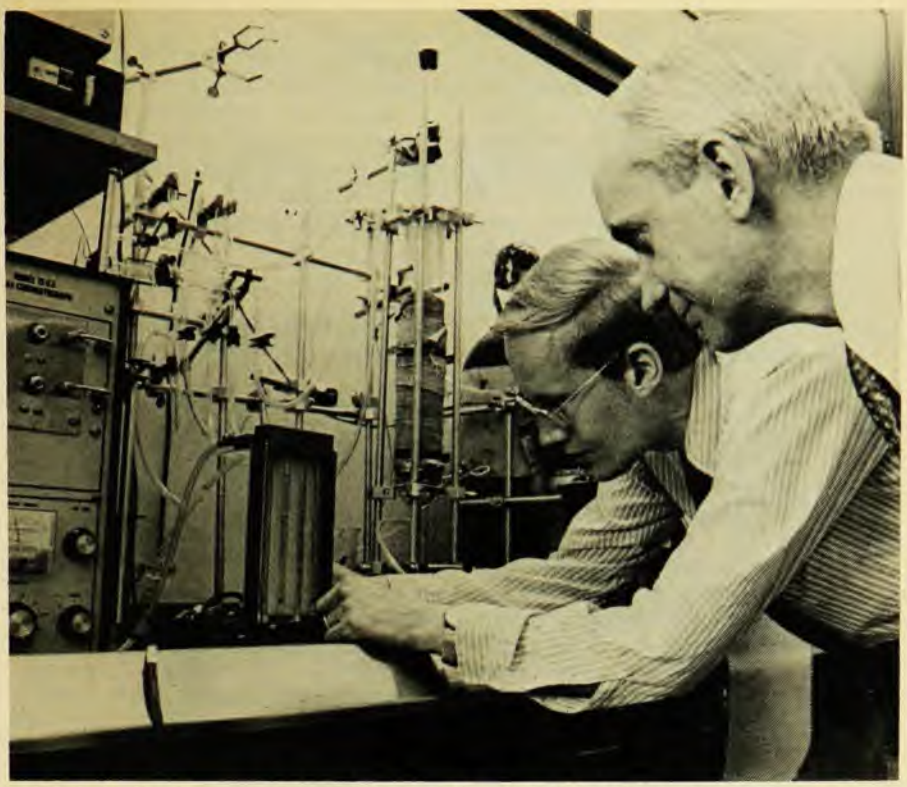
Matthias became interested in catalysis after talking with Willard Libby (UCLA), who suggested[2] that lanthanum cobaltite might be a good auto-exhaust catalyst. This is the same compound that D. B. Meadowcraft (Central Electricity Research Laboratory, Leatherhead, England) had earlier proposed[3] could be used in batteries.

The Bell group studied the perovskite-like compounds of $RE_{1-x}Pb_xMnO_3$ and $RECoO_3$, where RE stands for the rare earths lanthanum, praseodymium or neodymium. These inorganic oxides are made at high temperatures of about 1200 deg C so that chemically they are quite stable. The experimenters measured the oxidation of carbon monoxide (to produce carbon dioxide) by applying a continuous flow of CO and O_2 to a sample of about 2 cm^2 of catalyst, measuring the oxidation as a function of temperature and a function of time.

They compared their catalysts with a commercial one, the PTX catalyst marketed by Engelhard Minerals and Chemicals Corp; this is a fixed-bed catalyst that consists of about 0.5% (by weight) platinum on silicon dioxide–aluminum oxide arranged in a ceramic honeycomb structure. The experimenters crushed the Engelhard catalyst into pellets and compared it with crushed single crystals of their catalysts. They reported that neodymium lead manganite and praseodymium cobaltite were more active than the PTX catalyst and that the other manganites and cobaltites were about as active as the PTX catalyst. Furthermore they said that the activities of the manganites deteriorate much more slowly than that of the platinum.

Shortly after the Bell announcement, Engelhard's president, Milton F. Rosenthal, issued a statement criticizing the Bell report. He said the Bell results "were based solely on laboratory experiments and that no experiments have taken place with automobiles or with a simulated automobile exhaust-gas environment." He complained that the Bell method was to crush the PTX catalyst, but that Engelhard catalysts were specially fabricated with carefully controlled and dispersed quantities of platinum. In addition he said the flow rates that the Bell group used were too low for practical automotive use.

An Engelhard spokesman told us that the firm has a commitment from the Ford Motor Company to supply 60% of Ford requirements for exhaust catalysts in 1975 and to license them for the other 40% of their needs in that year. —GBL



Rudie J. H. Voorhoeve and Joseph P. Remeika of Bell Telephone Laboratories test new catalytic materials that may be useful for removing pollutants from automobile exhaust.

References

1. R. J. H. Voorhoeve, J. P. Remeika, P. E. Freeland, B. T. Matthias, Science **177**, 353 (1972).
2. W. F. Libby, Science **171**, 499 (1971).
3. D. B. Meadowcraft, Nature **226**, 847 (1970).

Shape isomers

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tute), James Nix (Los Alamos) and Wladyslaw Swiatecki (Berkeley) to reason that instead of having a smooth barrier there were actually two parabolas—a deep one where the nucleus normally sits and just to the right of it, on the falling outside wall of the potential, a second, shallower potential. Because the second minimum is higher in energy than the first, the spacing of its energy levels is much larger than the spacing at the same energy in the inside well. When you put neutrons in at different