Panel on Ozone Destruction Techniques

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The panel on Ozone Destruction Techniques discussed three general areas:

1. Ozone scrubber design,
2. Adsorbent or catalyst selection and characterization,
3. Alternate approaches to ozone removal.

In panel discussions on the second day of the Workshop items 1 and 3 from the list of three items were eliminated. "Ozone scrubber design" was eliminated because it was generally thought that airframe manufacturers could do a better job than NASA in the engineering of scrubbers for aircraft. "Alternate approaches to ozone removal" was eliminated from further consideration because none of the alternate approaches that have either been tried or thought of appeared to solve the problem of cabin ozone. Alternate approaches were either totally ineffective or only partially effective. In some cases alternate approaches were also too inefficient and costly.

The one area in which the panel felt NASA could make significant contribution was in the development and characterization of new materials for ozone removal. The primary objective in developing new materials for for ozone destruction would be to reduce weight, size and cost of the ozone removal device. The projected weight of the ozone scrubber using currently available catalyst materials is 150 pounds. No cost or size figures were given for currently available materials. In the development of new catalyst materials, it was thought desirable to seek catalysts that were effective in the two different temperature regimes: 1). 200-600^{o}F 2). ambient to 250^{o}F temperature. Different aircraft would require catalysts that operate in these different temperature regions.

In addition to developing improved materials for ozone destruction it was generally thought by our panel members that NASA could contribute in the following areas:

1. Study catalyst bed lifetime,
2. Study competitive reactivity (i.e., the influence of other contaminants in the inlet air on the catalyst bed efficiency for ozone removal,
3. Study the kinetics and mechanism by which ozone is destroyed on selected catalysts.

The reasons for studying 1 and 2 are obvious while the reasons for studying 3 are not immediately apparent. The panel thought NASA should study the kinetics and mechanism of ozone destruction for two reasons: 1) with this data available one could predict how the catalyst should perform under conditions not tested in the laboratory, 2) knowing the mechanism of ozone destruction on a given catalyst may aid in specifying the requirements for new and improved catalysts.

Catalyst evaluation conditions would be:

1). Contact or residence time - 5 to 60 milliseconds
2). Inlet ozone concentration 1.5 ppm
Outlet ozone concentration - 0.1 ppm
3). Operating pressure - 30 - 35 psig (same as 8th stage of compressor).