OVERVIEW OF HAZARDOUS WASTE INCINERATION TECHNOLOGY

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The subject paper is a good review of the common types of hardware in use today for incineration. I found the discussion of the various combustion chamber designs for different types of wastes most interesting. While the information is available in other publications, I have not seen it summarized as well.

I was somewhat disappointed by the relatively restricted discussion of the air pollution control systems. Only venturi and radial flow scrubbers were discussed for particulate (and some acid gas) pollutant removal. While these (or at least the venturi scrubber) are the most common, incinerators do use electrostatic precipitators, fabric filters and ionizing wet scrubbers for particulate removal as well. No mention at all was made of these.

The factors which influence the type of air pollution control equipment needed should also be mentioned. Particulate loading (mg/Nm) is very important but so is particle size distribution. Some of the hazardous waste incinerators now in service produce particulate in the 0.2-2 µg range. These are especially difficult to remove and significant amounts of money can be spent trying to reduce this particulate loading.

Finally, I would like to state that I do not consider a rotary hearth incinerator as a suitable design for most hazardous waste applications unless it is vented to a secondary combustion chamber. In this type of design, the waste is first brought into contact with relatively cool combustion gas which drives the volatiles off up the vent without being exposed to the flame. This arrangement cannot result in efficient destruction of any volatile hazardous constituents.

AUTHORS' REPLY

The points made by Dr. Weitzman in his review of the paper are well taken. We agree that equipment and processes for flue gas cleaning other than those mentioned in the paper are available for both non-hazardous and hazardous waste incineration. Furthermore, the selection of the flue gas cleaning system is highly dependent on the characteristics of the waste being incinerated and the thermal technique utilized.

With regard to the use of secondary combustion chambers, such chambers are recommended for hazardous waste incineration in general. The after-combustion chamber is of particular importance for those incineration chambers which operate at relatively low temperatures of 1000-1100°C, such as rotary hearths and fluidized beds. Although destruction of most hazardous components has been documented at temperatures as low as 800-900°C, many participants in the field are of the opinion that operations of commercial units will encounter unforeseen factors and variables which demand the provision of higher temperatures and residence times to ensure adequate destruction of the waste. After-combustion chambers, therefore, should be considered in all hazardous waste incineration units.