of this necessity, across groups, suggests that a primary condition for siting success is present. Such a situation would imply that the political involvement of the community in setting the parameters of siting could ameliorate contentious opposition, and the political inclusion of individuals may be more important to success than widespread education efforts that might tend to polarize positions and lead to "framing" by interested parties in an effort to capture public imagination. Political involvement, including compromise, sharing of responsibility, and the reinforcement of traditional attitudes associated with democratic governance, might very well maximize the potential for siting activities. We caution, however, that our findings are tentative, and that further research is needed to confirm some early indicators. The survey data do intimate that values imbedded in the political culture are important variables in analyzing reactions to emerging technical issues, such as nuclear power plants and hazardous waste facilities.

The role of fly-ash as a heterogeneous catalyst in the undesirable formation of chlorinated dibenzo-*p*-dioxins in municipal waste incineration

Alan M. Lane

Department of Chemical Engineering, University of Alabama, Box 870203, Tuscaloosa, AL 35487-6373 (USA)

Abstract

The formation of chlorinated dibenzo-*p*-dioxins in municipal waste incinerator fly-ash may be catalyzed by some component of the fly-ash itself. To test this hypothesis, the physical and chemical characteristics of fly ash samples will be correlated with observed dioxin levels. Certain of these traits may be associated with high dioxin levels.

We collected over a dozen fly-ash samples. They are all from relatively small municipal waste incinerators with electrostatic precipitators and no chemical addition. This is simply a consequence of which operators responded to our request for samples.

The samples were thoroughly characterized by SEM, pore structure, surface area, and surface and bulk chemical analysis. The samples appeared to all be

quite different. Surface areas ranged from 0.4–15.7 m^2/g. Surface chemical composition ranged from 0.8–38.5% Cl, 4.2–51.9% Si, and 0.1–1.1% Cu as examples. Bulk chemical analysis roughly tracked the surface analysis and again showed great variety. These observations were reinforced by SEM photos which showed that each sample was recognizably different, some looking like platelets, smooth spheres, or rough agglomerates.

Our dioxin analysis includes extraction in a soxhlet using toluene, purification in acid/base columns, and analysis in a GC/MS. The extraction and purification steps have all been done and the GC/MS concentrations will be presented with this paper. Any correlations of dioxin concentration with fly-ash properties will be presented.

Selective removal of metals from waste streams

Mark A. Fletcher and A. Akgerman

Department of Chemical Engineering, Texas A&M University, College Station, TX 77843-3136 (USA)

Abstract

Industrial wastewater contains high concentrations of metals such as copper, chromium, nickel, and zinc. It is desirable to recover each metal separately to allow recycling of metals and to satisfy waste minimization requirements. Metals can be selectively removed from aqueous solutions by chelation, since chelation of individual metals is controlled by pH. Research was undertaken to determine the parameters of the extraction of copper, chromium (III) and (VI), nickel, and zinc with two chelating agents, dithizone and Aliquat 336. The chelation reaction must be performed in a pH-buffered solution to maintain a constant pH. The percentage extraction of copper, nickel, and zinc with dithizone was measured at several pH values. The optimum pH for extraction of copper was pH 1, the optimum pH for extraction of zinc was pH 4, and the optimum pH range for extraction of nickel was pH 7–8. At pH 1 copper was selectively extracted from zinc and nickel by dithizone based on differences in