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FACULTY OF APPLIED SCIENCES

*DEPARTMENT OF APPLIED
CHEMISTRY*

**PROJECT TITLE: DETERMINATION AND RECOVERY OF ZINC
AND LEAD FROM FLY ASH GENERATED FROM MUNICIPAL
WASTE INCINERATION**

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**A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE
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ABSTRACT

Fly ash generated from municipal waste incineration and ashes that result from other thermal decomposition technologies of waste are often regarded as hazardous waste. The ash contains heavy metals such as lead, arsenic, mercury, and zinc in varying proportions, which are a serious problem to the environment. In this study, the determination of lead and zinc by acid digestion using FAAS was carried out. The concentration of lead and zinc in all fly ash samples were all higher than the USEPA maximum levels of lead and zinc in soils i.e. lead concentration varied from 153 to 174ppm whereas zinc concentration varied from 734 to 864ppm. The concentration levels of these heavy metals in dumpsite ash were determined to vary from 48 to 87ppm for lead and 308 to 379ppm for zinc. The relative standard deviations for zinc and lead concentration levels in all ash samples were determined to be lower than 15%. For the purpose of separating and extracting the heavy metals from the sample solutions, basic extraction characteristics of these metals using 8-hydroxyquinoline was also investigated. The best chelating agent concentration for optimal extraction was determined to be 40g/L while the optimal pH for the aqueous solution was 9.3. Although the optimal conditions for extraction were determined, zinc solubility at the conditions was lower. It was found that approximately 94% of Pb and 72% of Zn was extracted at these conditions.