FELDSPAR-FLUORIDE INTERACTIONS: EXAMINATION OF INTERFACIAL PROCESSES BY POTENTIOMETRY

A PROJECT REPORT PRESENTED BY

W.J.G.S.P.S. FERNANDO

to the Board of Study in Chemical Sciences of the
POST GRADUATE INSTITUTE OF SCIENCE

in partial fulfillment of the requirement
for the award of the degree of

MASTER OF SCIENCE IN ANALYTICAL CHEMISTRY

of the

UNIVERSITY OF PERADENIYA
SRI LANKA
2008

FELDSPAR-FLUORIDE INTERACTIONS: EXAMINATION OF INTERFACIAL PROCESSES BY POTENTIOMETRY

W.J.G.S.P.S. Fernando
Postgraduate Institute of Science
Peradeniya, Sri Lanka

Fluoride is biological active marginal harmful element that required 0.8 ppm in water to exhaust beneficial effect on human health IN Sri Lanka.

In this research, the feldspar and fluoride surface interaction were examined mechanistically experimental condition that are important from environmental view point.

The pH $_{PZC}$ of feldspar was pH 3.5 – pH 4.0 is found by > AlOH and > SiOH surface site and exhausting a domain by > SiOH. The surface of feldspar consists of uneven distribute of > SiOH and > AlOH site. Specific surface area was determined by methylene blue adsorption method is 9.791 $m^2 g^{-1}$.

Fluoride adsorption by feldspar is a rapid process reaching an apparently plateau within 20 min stirring time and 2.0 h equilibrium time.

The X- Ray diffraction (XRD) data confirm aluminium leached out as dominant mineral phase in feldspar. When feldspar is reacted with fluoride, there is an apparent change in XRD patterns.

There is no difference in data between convention fluoride determination and in-situ fluoride determination.

The results showed that feldspar which was obtained from Matale, Cations leached in the presence of fluoride and there were complexes of fluoride formation at low pH values.

Key words: Feldspar/ Fluoride/ cations leached/ In-situ fluoride ISE/ surface charge/ surface area