The values of Kielland coefficient ($K_C$) have been calculated and the ion exchange isotherm has also been plotted for two different values of time of contact.

(x) The Sr$^{2+}$ leach rate studies have led to three important conclusions which are parallel to those observed for Cs$^+$ retention in synthetic phases. These conclusions are:

(a) The Sr$^{2+}$ retention efficiency of powdered samples lies in the sequence 6.0 mole% Al-substituted tobermorite $>$ 2.5 mole % Al-substituted tobermorite $>$ unsubstituted tobermorite $>$ OPC.

(b) The washed powdered samples retain more Sr$^{2+}$ as compared to unwashed samples.

(c) The Sr$^{2+}$ retention increases with the corresponding increase in the weight % of tobermorites in the blocks of tobermorite + OPC admixtures.

The standardless EDS analysis has confirmed the presence of Sr$^{2+}$ (to the extent of 11.64 wt.% of Sr$^{2+}$) in the post leached block of OPC + tobermorite containing 30% tobermorite by weight.

(xi) The potassium fluorophlogopite (KFP) gel has also been investigated as an exchanger for Cs$^+$ selectivity. The gel has shown a good selective Cs$^+$ sorption in the presence of Ca$^{2+}$ and Mg$^{2+}$ ions. Like tobermorites with KFP also the following sequence of competing cations has been observed for the hindrance caused by them in the selective uptake of Cs$^+$ from the solutions,

$$K^+ >> Na^+ > Sr^{2+} > Ba^{2+} > Ca^{2+} > Mg^{2+}$$

As observed with tobermorite, in the case of KFP also the Cs$^+$ uptake by the gel is practically complete in about 24 hours.

(xii) The leach rate studies with KFP indicate that % Cs$^+$ retention increases in the sequence block $>$ washed powdered sample $>$ unwashed powdered sample.
similar sequence has been observed with tobermorites as mentioned above. Static leach rate studies of the blocks show that increase in the % of KFP gel in the OPC + KFP gel blocks is accompanied by a gradual increase in % Cs⁺ retention as observed with tobermorites also.

To sum up the above conclusions, it may suffice to state that tobermorite exhibits excellent sorption behaviour for Cs⁺ and Sr²⁺; its retention capacity is high over sufficiently long periods of time. Formulations containing Al-substituted tobermorites + OPC appear to be potential materials for immobilisation and solidification of cesium and strontium from ILW effluent of nuclear power plants. The KFP gel may also be used for decontamination of liquid waste containing active isotopes of cesium and strontium.
Appendix -i

LIST OF RESEARCH PUBLICATIONS

1. Intrinsic sorption potential of aluminium-substituted calcium silicate hydroxy hydrates for cesium-137.
   

2. Sr$^+2$ sorption and leach rate studies on synthetic calcium silicate hydroxy hydrates.
   

Appendix -ii

LIST OF PAPERS CONTRIBUTED IN CONFERENCES

1. Radiochemical study of intrinsic sorption potential of Al-substituted tobermorite for cesium-137.
   

2. Intrinsic sorption potential of Al-substituted calcium silicate hydroxy hydrate for Cs$^{137}$.
   
   NUCAR-95, IGCAR, Kalpakam, 1995.