seawater are summarized in Tables 1, and the map of the sampling locations is shown in Fig. 1.

Separation and purification of ^{99}Tc was carried out by the procedure reported previously [5]. The concentration of ^{99}Tc was determined by ICP-MS (PMS-2000, Yokogawa Ltd.) and the detection limit of the present method is more than 50 times lower than the beta-ray counting method.

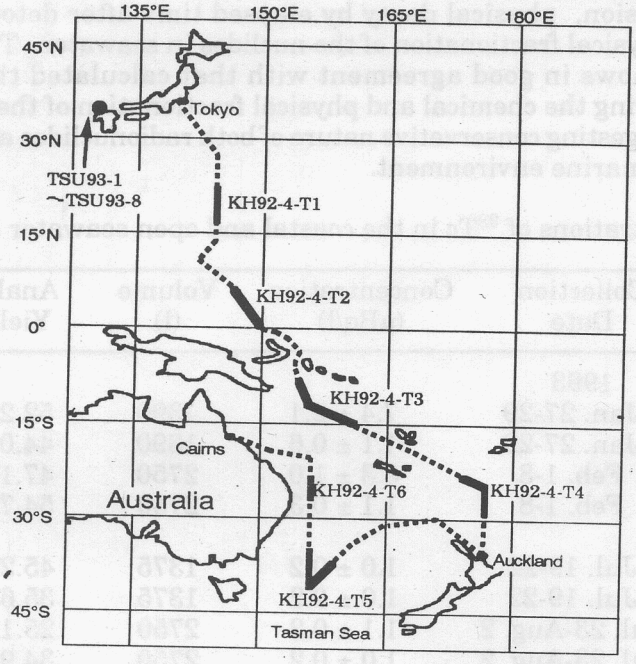

Fig. 1 Sampling locations of seawater

RESULTS AND DISCUSSION

The concentrations of ^{99}Tc measured by ICP-MS are summarized in Table 1 together with chemical recoveries. The recovery of ^{99}Tc was evaluated by ^{95m}Tc that was added to the sample as a yield monitor. The tracer was produced by a nuclear reaction ^{93}Nb (α, 2n) ^{95m}Tc using a cyclotron and no contamination of ^{99}Tc was confirmed on the ^{95m}Tc tracer solution by ICP-MS. The gamma energy of 204keV from the ^{95m}Tc was used for the yield determination and measured with a Ge detector.

The concentrations of ^{99}Tc in the coastal seawater ranged from 1.0 to 7.4 $\mu Bq\ l^{-1}$ and the measurement in the summer gave very consistent results, about 1 $\mu Bq\ l^{-1}$. A few $\mu Bq\ l^{-1}$ would be most likely in the coastal seawater in Japan. The concentrations of ^{99}Tc in the open seawater samples are lower than those in the coastal samples, showing a decrease in concentration toward the equator in the North Pacific Ocean. Lowest concentration was observed in the Tasman Sea, and near Australia the concentration increased to the level similar to the Japanese coastal seawater. The continuous decrease in concentration in the North Pacific Ocean and the slight increase in the middle