RiO5 METHOD (38)

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Po-210 in otolith: analytical method

The following is a historical method provided by J. Smith at BIO, Dartmouth, NS and dates to pre-1985. Additional information regarding this method may be found in the following publications:

Campana, S.E., K.C.T. Zwanenburg and J.N. Smith, 1990. Pb-2l0/Ra- 226 determination of longevity in redfish. Canadian Journal of Fisheries and Aquatic Sciences, 46: 163-165.

Bennett, J.T., G.W. Boehlert, and K.K. Turekian, 1982. Confirmation of longevity in (Sebastes diploproa) (Pisces:Scorpaenidae) from 210Pb/226Ra measurements in otoliths. Mar. Bio. 71:209-215

Po-210 in Otolith:- analytical method

Laboratory Equipment

- 30 Ml. beaker and watch glass
- Small stirring bar
- Glass rod
- Cap and screw neck piece from 30 ml. Nalgene LDPE plastic vial.
- 1 plastic disc to fit into the cap.
- Same size silver disk.(1.7 cm.)
- Stirrer hot plate
- Millipore filtratoin mechanism used in SR method.

Reagents

30 % H_2O_2
0.1 N HCL
1/2 Conc. HCl+HNo_3
Conc. HCL
0.5 n. HCL
Po-208 tracer
(act. =.592469 dpm/ml @30.12.86)

* Equipment and glasswear are boiled and cleaned in mild acid to reduce contamination. double-distilled acids are also essential. (Seastar quality)

Procedure

1) Clean otoliths

   - Take approximately 1 to 2 grams of otoliths into 30 ml. beaker and add 2 ml. of 30 % H_2O_2. Soak for 30 min.
   - Add 10 ml. 0.1 N HCL and rinse for 10 to 15 seconds.
   - Pour off liquid and add 10 ml. of H_2O to rinse out excess residue. repeat * 2. Try to remove all possible film left on the otoliths.
   - Put in the oven @ 40 deg. C. to dry over night.

2) Weigh otoliths and record weight.

3) Add 0.1 ml. Po-208 tracer.

4) Add 10 ml. 1/2 conc HCL+HNO_3, very slowly (1 ml. at a time) to avoid overflow from frothing.

5) When foaming subsides, completely evaporate the solution on the hot plate. (temperature set at approximately 150 - 200 deg C.)

6) Add 10 ml. conc. HCL

7) Evaporate the solution down again. Repeat, and cool.

8) Add 1 ml. H_2O_2 and leave over night.

9) Add 30 ml. 0.5 N. HCL.
   Filter solution through the Millipore filtration system.
   Use filter type HA 0.45 uM.

10) Plate solution at 85-90 deg. C. for approximately 4-6 hours onto silver disc encased in Nalgene 30 ml. LDPE plastic bottle cap. Make sure that it is totally immersed and is free of air bubbles. (Use a small stirring bar and a glass rod.)

11) Save solution for the Radium-226 analyses.

12) Count disc in L-spectrometer for approximately two to three weeks.

14) Calculate activity with APPLE-2 or P.C. computer using GWBASIC with program named PBOTH, or PBOTHP
(for printing out results.)

Blanks

.1 ml tracer → 30 ml beaker
+ 10 ml 1/2 conc $HCl + HNO_3$ → dry
10 ml conc HCl → dry
10 ml conc HCl → dry
+ 1 ml H_2O_2 leave overnight
+ 30 ml .5 M HCl → plating