Tritium ventilation ages of waters along 36°N and 25°W in the subtropical North Atlantic Ocean

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The ocean plays an important role in climate variability and change. It transports heat on a global scale. Changes in ocean biogeochemistry can directly feed back to the climate system, for example, through changes in the uptake or release of active gas such as CO_2. However, the change in heat content and ocean carbon pump capacity are complicated systems and the controlling mechanisms have not yet been clearly identified. Ocean samples have been collected in a transect along 36°N in the Atlantic Ocean and an Atlantic merdional transect leg along 25°W. These ocean regions are critical for evaluating the ventilation ages which control the heat content change and identifying the regional variations in export production over the subtropical North Atlantic.

Besides measurements of nutrients, oxygen, carbon, SF_6 and CFCs in water samples, analysis of tritium-helium in waters provides age information measuring the time since the fluid was last in the mixed layer. The implied tritium-helium ages, which are optimal for ages less than 15 years, will complement the CFCs derived ages. The determination of tritium ages of water samples is essential for calculating rates, such as, the apparent oxygen utilization rate.

We present preliminary tritium results of waters along 36°N and 25°W in the subtropical North Atlantic Ocean. Tritium is present in bottom waters in most stations. Vertical profiles of tritium ventilation ages in all stations show that they have the expected maximum in the surface layer and decrease with depth. The horizontal distribution of tritium shows that ventilation rates are higher in the eastern part than in the western section of the 36°N transect. These tritium ventilation ages provide the basis for modelling mechanisms controlling heat content changes and estimates of export production.

Mafic magmatism in the Siziwangqi area of Inner Mongolia, China: Geochronology constraints and tectonic implications

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The Siziwangqi area is an important district for study of the paleozoic crustal growth and recycling of Xing-Meng orogenic belt along the northern margin of the North China Block [1-4]. Zircons separated from rock samples representative of three gabrro-dioritic plutons are dated by using LA-ICP-MS U-Pb dating method.

The Weijing dioritic pluton intruded into the green-amphibole facies metamorphic rocks in the western part of the Xilinhot-Sonidzuoqi belt. LA-ICP-MS U-Pb dating of zircons from this plutonic rocks yielded an emplacement ages of 508±10 Ma and a metamorphism age of 467±9 Ma. These results imply that subduction of the oceanic slab occurred at least before 500 Ma, and arc–continent collision took place around 460-400 Ma. The emplacement ages of the dioritic and gabrrotic plutons in the Siziwangqi county are 331±5 Ma and 302±2 Ma, respectively. These date marks the the initial time of the continent-continental collision between the North China Plate and Siberian Plate along the Xing-Meng orengic belt.

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