photon transmission at the 330–420 nm wave length. Active properties require 380–420 nm photon production with a prompt primary decay fluorescence approaching 2 nsec and a secondary delayed emission from 100–600 nsec.

Four materials meeting the above criteria have been evaluated. Their active/passive guard properties are discussed as well as their capabilities for background reduction.

14C PROFILES IN THE NORWEGIAN AND GREENLAND SEAS BY CONVENTIONAL AND AMS MEASUREMENTS

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CO2 in the atmosphere is the most important climate gas, and more knowledge about CO2 uptake in the ocean is of prime importance in predicting future development. Radioactive carbon from nuclear tests, during a period of about 30 years, has been a very useful tracer in CO2 exchange studies. Up to now, the measurements have been based mainly on conventional counting techniques with large CO2 samples (ca 5 L). The AMS technique on small CO2 samples (ca 5 ml) has made it much easier to perform sampling, and this development has especially stimulated the use of 14C as a tracer in the ocean.

In higher latitudes, the ocean acts as a sink for CO2. The present paper is concerned with CO2 (DIC), 14C and 13C measurements in the Norwegian and Greenland Seas. During cruises in 1989 and 1990, it was possible to obtain several 14C profiles, and also to repeat a few GEOSECS profiles from 1972. The shape of these profiles changes with time, and gives information about the mixing rate and the age of the deep water. From changes in the profiles, we see that the deep water in this area has only reached about 10–20% of the 14C concentration in the ocean surface during a period of 25 years.

SUBMERGED PLANTS AND THE SLOW RESPONSE TO CHANGES IN RADIOCARBON ACTIVITY OF ATMOSPHERIC CARBON DIOXIDE

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Various submerged plants from some lakes close to Uppsala, Sweden, have been studied for a decade. The 14C activity was lower than that of atmospheric CO2 when the investigation started, but now it is higher for some of the plants, indicating a slow response to the present decrease of the excess due to nuclear-weapon tests. Plant species react differently to different processes of CO2 uptake. Thus, the activity values of plants taking their CO2 from the sediment are dependent on different conditions in the same lake. The NaOH-soluble fraction of lake sediments is the preferred fraction after normal pretreatment unless terrestrial debris can be used, or a more sophisticated pretreatment is developed and applied. Also, since emergent lake plants have different 14C activities than submerged plants, the reservoir age of lake sediments may vary throughout the history of the lake, but this also may result from the position in the lake.