

TEFLON VIALS FOR PRECISE C-14 IN BENZENE MEASUREMENTS BY LSC TECHNIQUE.

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LSC equipment developers and manufacturers are using vials of Teflon due to their extreme performances - high counting efficiency and low background. As for measurements of radiocarbon, most applicable range of inner volume is of 0.3 to 7 ml. Practical aspects of Teflon vial for C14 use are benzene leakage and vial durability.

We had developed and well tested Teflon vials using Teflon and titanium as materials. Thinking about possible sorption, we avoid using of other materials. To control counting efficiency we avoid presence of any “dead zone” inside. Both, flask and cap are produced of Teflon, when metal base and pin valve are produced of titanium. Each vial uses spline Teflon to Teflon coupling and metal washers. We produce vials with volumes of: 0.8, 1.5, 2.5, 4.0 and 7.0 ml.

After filling with benzene sample, vial is covered with cap. Then walls of vial is lightly compressed to reduce air in vial, and after that pine valve located in cap finally closes inner volume of vial. This, last one, keeps vial under minor vacuum and minimizes benzene leakage.

Background count rate corresponds one of other Teflon vial of the same volume measured in similar counting condition. Counting efficiency, measured for some vials (2.5ml and 4.0ml) is higher because of better light collection achieved by optimal ratio of height and diameter of flask. As we had estimated, leakage of benzene is below 0.1% for one months of storage for series of several vials.