



Benzene line: equipment, laboratory setup and staff training

VACUUM PYROLYSIS

BENZENE LINE is developed for production of benzene used as counting media for Conventional Radiocarbon Dating, when benzene sample is counted by Liquid Scintillation Counting. **Benzene line** widely uses vacuum pyrolysis in benzene production process.

VACUUM PYROLYSIS in Radiocarbon Dating (1998) : The direct chemisorption into a lithium alloy of carbonaceous gases produced by the controlled thermal degradation (pyrolysis) of organic materials under vacuum (see scheme of reaction vessel operation on Figure, right). This approach offers the advantage of a single stage, highly efficient and economical procedure for the production of lithium carbide. It is applicable for most types of sample material encountered in routine dating work and including organic detritus dispersed in a highly (up to 95% by weight) mineral matrix and/or carbonates. Bone collagen can also be processed without the need for its prior extraction and purification.

INITIAL IDEA of vacuum pyrolysis was published in 1998 [**Skripkin and Kovaliukh**]. Future developments are enclosed in materials used in Benzene line, and knowledge given in users manual and during of staff training. We use selected material – Titanium, Teflon, Stainless Steel and Boron-Silicate Glass. Our general approach is to optimize volume (diameter and length) of benzene line. Vacuum pyrolysis lasts fits into base idea of benzene line - minimize of volume - in metal reaction vessel.

ADVANTAGES of Vacuum Pyrolysis in Benzene Line are: - applicability for different materials; - applicability for fractioning materials; - applicability for different matrixes (solid, gases, liquid); - applicability for highly contaminated samples; - applicability for low **Carbon** materials;
- high chemical yield for **Carbon** processed; - high purity of carbide resulting; - short time of sample processing; - 2-5 times reduction of time for sample processing cycle.

REFERENCES

1. **V.V. Skripkin, N.N. Kovaliukh. Recent developments in the procedures used at the SSCER Laboratory for the routine preparation of lithium carbide. RADIOCARBON. Vol 40, No 1 (1998)**

Main : Radio Carbon Dating Maschine : Vacuum Pyrolysis : Set-Up & training : Teflon vials : Equipment : Application : E-mail : PDF : Doc : JPG : Sitemap :

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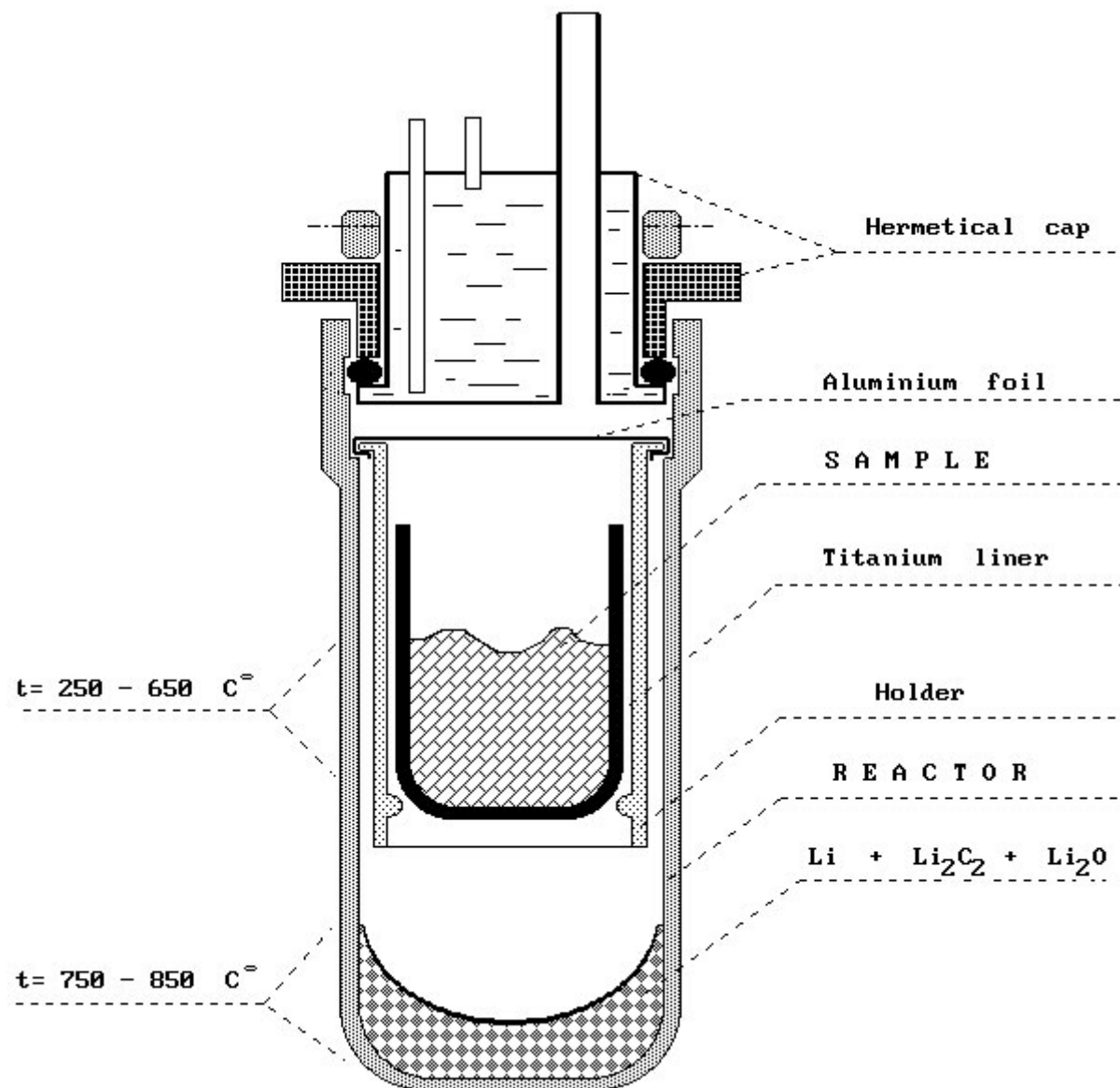


Figure. 1. Scheme of High temperature reaction vessel - heart of benzene line (1998)
 TAGS: [Teflon](#), [Stainless steel](#), [Titanium](#), [Glassware](#), [Vials](#), [Catalyst](#), [Vacuum pyrolysis](#), [Sublimation](#),
[Cryogenic trapping](#), [Wood](#), [Charcoal](#), [Peat](#), [Soil](#), [Carbonate](#), [Shell](#), [Bone](#), [Radio Carbon Dating Maschine](#)