

[54] DIFFERENTIAL CALORIMETER BASED ON THE HEAT LEAK PRINCIPLE

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[21] Appl. No.: 952,155

[22] Filed: Oct. 17, 1978

[51] Int. Cl.³ G01K 17/00

[52] U.S. Cl. 73/15 B; 73/190 R

[58] Field of Search 73/15 B, 190 R

[56] References Cited

U.S. PATENT DOCUMENTS

3,059,471	10/1962	Calvet	73/15
3,263,484	8/1966	Watson et al.	73/15
3,283,560	11/1966	Harden et al.	73/15
3,373,607	3/1968	Schoenlaub	73/190
3,572,084	3/1971	May	73/15
4,149,401	4/1979	Hentze	73/15

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[57] ABSTRACT

A differential scanning calorimeter based on the heat leak principle having a reference measuring cell and a sample measuring cell symmetrically seated within a copper heat sink surrounded by an isothermal shield. Each measuring cell includes a cylindrical stainless steel ampoule which contains a test substance, a honey-combed aluminum cell frame which supports the ampoule, and a pair of thermopiles which are placed between the aluminum cell frame and the copper heat sink and which measure the temperature difference between the two. A plurality of resistive heating elements wired in series are applied to different sections of the heat sink and the isothermal shield, each heating element having a resistance respectively proportional to the heat capacity of the heat sink sections and the shield. A common current is then passed through the heating elements, thus producing a highly uniform positive temperature scan with a minimum of residual temperature gradients existing within the heat sink. The ampoules in the measuring cells are individually pressurizable whereby calorimetric data as a function of pressure can be obtained.

Primary Examiner—Herbert Goldstein

25 Claims, 11 Drawing Figures

