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**20 February 2002**

**Committee D16 on Aromatic Hydrocarbons and Related Chemicals  
Subcommittee D16.01 on Benzene, Toluene, Xylenes, Cyclohexane and  
Their Derivatives**

**Research Report RR #D16-1028**

**Inter-Laboratory Study to Establish Precision Statements for ASTM  
D852, Standard Test Method for Solidification Point of Benzene**

**Technical Contact:**

Mr. James Graham,  
Baytown, TX 77522  
USA  
281-834-5267  
James.e.graham@exxon.com

ASTM International  
100 Barr Harbor Drive  
West Conshohocken, PA 19428-2959

**1. Title:**

ASTM Committee D-16 on Aromatics Hydrocarbons and Related Chemicals  
Research Report: RR-D-16:XXXX  
Interlaboratory Test Study for D 852 Standard Test Method for Solidification Point of benzene

**2. Introduction**

An inter-laboratory study was conducted to update the current thermometer repeatability statement and provide a full thermistor precision statement for D 852, Standard Test Method for Solidification Point of benzene. A single laboratory determined the solidification point of a benzene sample twelve times following D 852-97 to provide the thermometer data. Seven different laboratories determined the solidification point of three different benzene samples in triplicate on two different days following D 852-97 to provide the thermistor data. The updated thermometer repeatability statement and new thermistor precision statement were calculated per E 691.

**3. Test Method**

D 852-97 was distributed to each laboratory.

**4. List of Participating laboratories**

Participating Laboratories are listed in Table 1, Participating Laboratories.

Laboratory	Contact	Address
Core Laboratory	Craig Brumley/Pat Gideon	8210 Mosley Houston, TX 77075-1110
ExxonMobil Chemical	James Graham, Mark Craig	Basic Chemical Laboratory 5000 Bayway Drive Baytown, TX 77522
Equistar	B. Graves	FM 2917 Alvin, TX 77512
ITS-Caleb Brett	Marcus Shannon/James Allen	11727 Port Rd. Seabrook, TX 77586
Saybolt Inc	Luis Ibana	3113 Red Bluff Road Pasadena, TX 77503
Chevron Phillips Chemical Company	Larry Rhodes	PO Box 1547 Port Arthur, TX 77644-1547
ExxonMobil Chemical	Ray Tuohy	Beaumont Olefins Aromatics Plant 2775 Gulf States Road Beaumont, TX 77704

Location of thermometer study.

**5. Interlaboratory Test Program Instructions**

1. Thermometer study - Analyze one benzene sample twelve times following D 852-97 using the method specified thermometer.
2. Thermistor study - Analyze each of three benzene samples (sample 1 = recrystallized benzene, sample 2 = slightly impure benzene, sample 3 = off specification benzene) three times on two different days following D 852-97 using the method specified thermistor.
3. Report results to Mark Craig and/or James Graham at:  
ExxonMobil Chemical  
5000 Bayway Drive  
Basic Chemicals Laboratory  
Baytown, TX 77522  
Or via email at:  
James.e.graham@exxon.com

**6. Questionnaires**

N/A

## 7. Data Report Forms

In total, 12 solidification point results were determined via D 852-97 using a thermometer, and 126 solidification point results were determined via D 852-97 using a thermistor. Raw data are presented in Tables 2, Thermometer Solidification Point of Benzene, and Table 3, Thermistor Solidification Point of Benzene.

5.50
5.51
5.55
5.53
5.52
5.52
5.54
5.51
5.53
5.53
5.54
5.52

Sample	Day	Lab 1	Lab 2	Lab 3	Lab 4	Lab 5	Lab 6	Lab 7
1	1	5.541	5.488	5.496	5.497	5.492	5.592	5.498
1	1	5.528	5.489	5.494	5.494	5.493	5.622	5.5
1	1	5.523	5.488	5.495	5.492	5.537	5.617	5.496
1	2	5.500	5.489	5.497	5.494	5.496	5.547	5.493
1	2	5.494	5.490	5.498	5.493	5.496	5.580	5.494
1	2	5.487	5.490	5.495	5.495	5.494	5.575	5.491
2	1	5.433	5.433	5.438	5.435	5.350	5.444	5.441
2	1	5.439	5.436	5.441	5.439	5.437	5.516	5.439
2	1	5.441	5.418	5.435	5.489	5.441	5.528	5.45
2	2	5.428	5.423	5.438	5.437	5.440	5.510	5.419
2	2	5.430	5.425	5.438	5.440	5.437	5.544	5.434
2	2	5.436	5.418	5.439	5.440	5.440	5.538	5.445
3	1	5.375	5.323	5.357	5.377	5.378	5.464	5.374
3	1	5.380	5.325	5.372	5.385	5.383	5.438	5.373
3	1	5.370	5.325	5.375	5.392	5.382	5.427	5.382
3	2	5.375	5.312	5.353	5.382	5.320	5.475	5.379
3	2	5.376	5.355	5.364	5.390	5.376	5.511	5.383
3	2	5.372	5.368	5.367	5.383	5.370	5.530	5.384