Supporting Information

Liquid Heat Capacity Measurements of the Linear Dicarboxylic Acid Family via Modulated Differential Scanning Calorimetry

*Joseph C. Bloxham, Daniel Hill, Thomas A. Knotts, IV, Neil F. Giles, W. Vincent Wilding**

Department of Chemical Engineering, Brigham Young University, Engineering Building, Rm 330, Provo, Utah 84602, United States

*Corresponding author: Telephone: 801-422-2000, E-mail: vincent_wilding@byu.edu

Linear fits of the data are shown in Figures 2 and 3(?). These are fit to the reported values at each temperature. The model is:

$$y = m\,x + b$$

Table S1. Linear Fits to Experimental Data in Table 2. Fits Shown in Figures 2 and 3

Compound	m	b	R^2
adipic acid	0.002314	1.452	0.9478
pimelic acid	0.003183	1.104	1.0
suberic acid	0.002431	1.454	0.8750
azelaic acid	.002076	1.668	0.9594
sebacic acid	0.002713	1.360	0.9613
dodecanedioc acid	0.002860	1.383	0.9985
tetradecanedioic acid	0.002220	1.784	0.9976
dimethyl oxalate	0.002890	0.914	0.9525

Table S2. Predicted Values Using Ruzicka-Domalski, Ruzicka-Domalski with Constants from Table 3, and the Derivative Method Used to Calculate AAD in Table 4.

Compound	*T*/K	Ruzicka-Domalski Predicted Values/(J mol $^{-1}$ K^{-1})	Updated Ruzicka-Domalski Predicted Values/(J mol $^{-1}$ K^{-1})	Derivative Method/ (J mol $^{-1}$ K^{-1})
adipic acid	433.09	374.0	366.9	348.4
	463.07	397.0	374.1	361.8
	493.04	421.2	380.2	374.6
	523.01	446.8	385.3	387.3
pimelic acid	423.09	403.8	401.5	406.3
	448.07	424.3	409.7	417.3
suberic acid	423.10	441.0	438.7	465.3
	448.08	463.4	448.7	479.2
	473.07	486.9	458.2	491.8
	513.02	526.7	472.3	509.8
azelaic acid	393.11	450.8	461.2	482.8

	433.09	487.8	480.7	508.8
	473.06	527.8	499.2	531.0
	513.03	571.0	516.6	550.2
sebacic acid	413.11	505.4	507.7	504.3
	453.08	546.8	529.5	537.3
	493.06	591.6	550.6	566.2
	533.02	639.8	570.9	592.2
	572.92	691.4	590.5	617.6
dodecanedioc acid	423.09	589.9	587.6	573.1
	448.08	619.5	604.9	595.4
	473.06	650.7	622.1	616.3
	523.0	717.7	656.3	654.7
	572.95	791.0	690.1	691.0
tetradecanedioic acid	423.10	664.3	662.1	640.3
	473.06	732.6	704.0	684.5
	513.02	792.4	746.6	717.0
	523.02	808.1	789.7	724.8
	572.97	890.6	738.0	765.9

Table S3. Regression Information for Dicarboxylic Acid Prediction Shown in Equation 3

Compound	*T*/K	Prediction from eq 3	AAD (%)
adipic acid	433.09	357.2	0.43%
	463.07	369.4	0.90%
	493.04	381.6	0.51%
	523.01	393.8	1.69%
pimelic acid	423.09	392.2	1.20%
	448.07	403.0	1.70%
suberic acid	423.10	432.6	1.52%
	448.08	443.9	1.91%
	473.07	455.3	1.62%
	513.02	473.5	1.38%

azelaic acid	393.11	459.7	0.27%
	433.09	478.8	1.78%
	473.06	497.9	0.95%
	513.03	517.0	1.22%
sebacic acid	413.11	511.8	2.13%
	453.08	531.8	1.77%
	493.06	551.8	0.35%
	533.02	571.8	2.65%
	572.92	591.8	0.30%
dodecanedioc acid	423.09	605.8	1.59%
	448.08	619.4	0.55%
	473.06	633.0	0.57%
	523.0	660.2	0.09%
	572.95	687.4	1.03%
tetradecanedioic acid	423.10	699.3	0.78%
	473.06	728.5	0.28%
	513.02	751.9	0.19%
	523.02	757.8	0.61%
	572.97	787.0	0.39%