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The vaporization enthalpy and vapor pressure of (d)-amphetamine and of several primary amines used as standards at T /K = 298 as evaluated by correlation gas chromatography and transpiration

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Abstract

The vapor pressures of several aliphatic and phenyl substituted primary amines at T/K = 298.15 are measured by transpiration studies, and their vaporization enthalpies are calculated. The results were combined with compatible literature values to evaluate both the vaporization enthalpy and vapor pressure of (d)-amphetamine by correlation gas chromatography. The results are compared to existing values either estimated or measured for racemic amphetamine. Vaporization enthalpies and vapor pressures at T/K = 298.15 of the following were measured by transpiration (kJ·mol-1, p/Pa): 1-heptanamine, (49.75 ± 0.38, 291); 1-octanamine, (55.05 ± 0.29, 108); 1-decanamine, (64.94 ± 0.32, 12); benzylamine, (54.32 ± 0.32, 88); (dl)-α-methylbenzylamine, (55.26 ± 0.33, 82); 2-phenethylamine (57.51 ± 0.35, 43). The use of several of these materials as standards resulted in a vaporization enthalpy and vapor pressure for (d)-amphetamine at T/K = 298.15 of (58.2 ± 2.7) kJ mol-1 and (38 ± 12) Pa. © 2013 American Chemical Society.

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