

Freezing Point Depression Lab

Sample Data Table (Actual student data will vary.)

Temperature of Pure Ice-Water Mixture = _____ °C

Beaker Number	Additive to Ice-water Mixture	Mass of Ice + Water (g)	Exact Mass of Additive (g)	Lowest Temperature of Mixture (°C)	Lowest Temperature of Mixture (°C) (Class Average)
1	Sodium chloride NaCl	100.2	30.3	-16.7	-16.7
2	Sucrose $C_{12}H_{22}O_{11}$	100.8	30.1	-1.5	-1.5
3	Calcium chloride $CaCl_2 \cdot 2H_2O$	100.7	30.3	-11.5	-11.5
4	Aluminum chloride $AlCl_3 \cdot 6H_2O$	100.1	30.0	-11.1	-11.1

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Sample Data Analysis Table (Actual student data will vary.)

Beaker Number	Additive	Formula Weight (g/mol)	ΔT_f (°C)	Moles of Additive	$\frac{\Delta T_f}{\text{mole}}$ (°C)	n	m	ΔT_f (°C) (theoretical)	% Error
1	NaCl	58.45	16.7	.518	32.2	2	5.17	19.2	13.0%
2	$\text{C}_{12}\text{H}_{22}\text{O}_{11}$	342.31	1.5	.0879	17.1	1	0.872	1.62	7.4%
3	$\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$	147.02	11.5	.206	55.8	3	2.05	11.4	.88%
4	$\text{AlCl}_3 \cdot 6\text{H}_2\text{O}$	241.43	11.1	.124	89.5	4	1.24	9.23	20.3%