

Table S1. Concentrations and conductivities for 0.001 M total ionic strength solutions.

Solution Number		1	2	3	4	5	6	7
Stoichiometric Salt Concentrations (M)	Measured CuCN	0.000473	0.000450	0.000400	0.000350	0.000300	0.000250	0.000200
	Measured NaCN	0.000762	0.000754	0.000739	0.000733	0.000742	0.000769	0.000806
	Adjusted NaCN	0.000752	0.000744	0.000729	0.000722	0.000731	0.000758	0.000795
	Hidden Na ₂ CO ₃	4.86E-06	4.81E-06	4.71E-06	4.67E-06	4.73E-06	4.90E-06	5.14E-06
Calculated Equilibrium Concentrations (M)	Cu+	4.40E-19	2.68E-19	7.68E-20	1.61E-20	2.68E-21	4.85E-22	1.16E-22
	CN-	2.30E-05	2.74E-05	4.24E-05	7.19E-05	1.29E-04	2.19E-04	3.30E-04
	Na+	7.62E-04	7.53E-04	7.38E-04	7.32E-04	7.41E-04	7.68E-04	8.06E-04
	n=1	4.85E-08	3.53E-08	1.56E-08	5.55E-09	1.65E-09	5.08E-10	1.83E-10
	n=2	2.35E-04	2.04E-04	1.40E-04	8.41E-05	4.49E-05	2.34E-05	1.27E-05
	n=3	2.37E-04	2.45E-04	2.59E-04	2.64E-04	2.53E-04	2.24E-04	1.84E-04
	n=4	2.63E-07	3.24E-07	5.30E-07	9.16E-07	1.57E-06	2.36E-06	2.93E-06
	CO ₃ 2-	4.58E-07	4.85E-07	5.66E-07	6.93E-07	8.83E-07	1.12E-06	1.37E-06
	HCO ₃ -	4.40E-06	4.32E-06	4.14E-06	3.98E-06	3.85E-06	3.78E-06	3.78E-06
	H ₂ CO ₃	4.53E-09	4.12E-09	3.25E-09	2.44E-09	1.79E-09	1.37E-09	1.12E-09
	HCN	1.82E-05	2.01E-05	2.55E-05	3.39E-05	4.61E-05	6.06E-05	7.49E-05
	H+	4.43E-10	4.10E-10	3.37E-10	2.64E-10	2.00E-10	1.55E-10	1.27E-10
	OH-	2.26E-05	2.44E-05	2.97E-05	3.79E-05	4.99E-05	6.44E-05	7.87E-05
Complex Concentration (Percentage of Total Copper)	n=1	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%
	n=2	50%	45%	35%	24%	15%	9%	6%
	n=3	50%	55%	65%	76%	84%	90%	92%
	n=4	0.1%	0.1%	0.1%	0.3%	0.5%	0.9%	1.5%
Average n		2.50	2.55	2.65	2.76	2.86	2.92	2.95
Individual Complex Conductivity (Percentage of Total Complex Conductivity)	n=2	25%	22%	15%	9%	6%	3%	2%
	n=3	75%	78%	85%	90%	94%	95%	96%
	n=4	0%	0%	0%	0%	1%	1%	2%
Measured Conductivity (mS/cm)	#1	0.092	0.095	0.093	0.096	0.102	0.107	0.112
	#2	0.093	0.094	0.093	0.095	0.101	0.106	0.110
	#3	0.094	0.095	0.094	0.095	0.100	0.107	0.113
	#4	0.094	0.094	0.093	0.094	0.102	0.106	0.112
Non-Complex Part of Conductivity (mS/cm)		0.045	0.045	0.046	0.050	0.057	0.069	0.082
Complex Part of K (mS/cm)	#1	0.048	0.050	0.047	0.046	0.045	0.038	0.030
	#2	0.049	0.049	0.046	0.045	0.044	0.037	0.028
	#3	0.049	0.050	0.048	0.045	0.043	0.038	0.031
	#4	0.049	0.049	0.047	0.044	0.044	0.037	0.030
Complex Part of K (%)	#1	52%	52%	50%	48%	44%	36%	26%
	#2	52%	52%	50%	47%	43%	35%	26%
	#3	52%	53%	51%	48%	43%	36%	27%
	#4	52%	52%	50%	47%	44%	35%	27%

Table S2. Concentrations and conductivities for 0.01 M total ionic strength solutions.

Solution Number		8	9	10	11	12	13
Stoichiometric Salt Concentrations (M)	Measured CuCN	0.00500	0.00450	0.00400	0.00350	0.00300	0.00200
	Measured NaCN	0.00757	0.00732	0.00708	0.00689	0.00690	0.00750
	Adjusted NaCN	0.00746	0.00722	0.00699	0.00679	0.00680	0.00740
	Hidden Na ₂ CO ₃	4.83E-05	4.67E-05	4.52E-05	4.39E-05	4.40E-05	4.79E-05
Calculated Equilibrium Concentrations (M)	Cu ⁺	5.46E-18	1.63E-18	3.03E-19	1.67E-20	1.86E-22	1.54E-24
	CN ⁻	2.16E-05	3.33E-05	5.99E-05	1.60E-04	6.99E-04	2.95E-03
	Na ⁺	7.56E-03	7.31E-03	7.08E-03	6.88E-03	6.89E-03	7.49E-03
	n=1	5.64E-07	2.60E-07	8.70E-08	1.28E-08	6.23E-10	2.17E-11
	n=2	2.57E-03	1.83E-03	1.10E-03	4.33E-04	9.18E-05	1.35E-05
	n=3	2.42E-03	2.66E-03	2.89E-03	3.04E-03	2.81E-03	1.74E-03
	n=4	2.52E-06	4.27E-06	8.34E-06	2.35E-05	9.46E-05	2.47E-04
	CO ₃ ²⁻	8.68E-06	8.72E-06	9.17E-06	1.10E-05	1.62E-05	2.52E-05
	HCO ₃ ⁻	3.96E-05	3.80E-05	3.60E-05	3.29E-05	2.78E-05	2.27E-05
	H ₂ CO ₃	1.93E-08	1.77E-08	1.51E-08	1.06E-08	5.11E-09	2.19E-09
	HCN	8.08E-06	1.19E-05	1.93E-05	3.95E-05	9.87E-05	2.18E-04
	H ⁺	2.10E-10	2.00E-10	1.81E-10	1.38E-10	7.91E-11	4.15E-11
	OH ⁻	4.77E-05	4.99E-05	5.54E-05	7.25E-05	1.27E-04	2.41E-04
Complex Concentration (Percentage of Total Copper)	n=1	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%
	n=2	51%	41%	28%	12%	3%	1%
	n=3	49%	59%	72%	87%	94%	87%
	n=4	0.1%	0.1%	0.2%	0.7%	3.2%	12.4%
Average n		2.49	2.59	2.73	2.88	3.00	3.12
Individual Complex Conductivity (Percentage of Total Complex Conductivity)	n=2	26%	18%	11%	4%	1%	0%
	n=3	74%	81%	89%	95%	95%	84%
	n=4	0%	0%	0%	1%	4%	15%
Measured Conductivity (mS/cm)	#1	0.862	0.858	0.824	0.826	0.863	0.950
	#2	0.862	0.857	0.839	0.831	0.858	0.960
	#3	0.881	0.867	0.848	0.843	0.871	0.945
	#4	0.883	0.871	0.847	0.851	0.862	0.946
Non-Complex Part of Conductivity (mS/cm)		0.393	0.382	0.373	0.375	0.428	0.658
Complex Part of K (mS/cm)	#1	0.469	0.476	0.451	0.451	0.435	0.292
	#2	0.469	0.475	0.466	0.456	0.430	0.302
	#3	0.488	0.485	0.475	0.468	0.443	0.287
	#4	0.490	0.489	0.474	0.476	0.434	0.288
Complex Part of K (%)	#1	54%	55%	55%	55%	50%	31%
	#2	54%	55%	56%	55%	50%	31%
	#3	55%	56%	56%	56%	51%	30%
	#4	55%	56%	56%	56%	50%	30%

Table S3. Concentrations and conductivities for 0.1 M total ionic strength solutions.

Solution Number		14	15	16	17	18	19	20
Stoichiometric Salt Concentrations (M)	Measured CuCN	0.0400	0.0350	0.0300	0.0250	0.0200	0.0150	0.0125
	Measured NaCN	0.0704	0.0679	0.0651	0.0632	0.0636	0.0677	0.0713
	Adjusted NaCN	0.0694	0.0669	0.0642	0.0624	0.0627	0.0667	0.0703
	Hidden Na ₂ CO ₃	4.49E-04	4.33E-04	4.16E-04	4.03E-04	4.06E-04	4.32E-04	4.55E-04
Calculated Equilibrium Concentrations (M)	Cu ⁺	2.74E-18	9.05E-20	8.63E-23	1.70E-24	9.44E-26	6.97E-27	2.09E-27
	CN ⁻	6.22E-05	1.98E-04	1.92E-03	6.33E-03	1.42E-02	2.75E-02	3.66E-02
	Na ⁺	7.03E-02	6.78E-02	6.51E-02	6.32E-02	6.35E-02	6.76E-02	7.12E-02
	n=1	8.17E-07	8.58E-08	7.95E-10	5.16E-11	6.40E-12	9.20E-13	3.66E-13
	n=2	1.07E-02	3.58E-03	3.22E-04	6.88E-05	1.91E-05	5.34E-06	2.82E-06
	n=3	2.91E-02	3.11E-02	2.71E-02	1.91E-02	1.19E-02	6.43E-03	4.52E-03
	n=4	8.74E-05	2.96E-04	2.51E-03	5.82E-03	8.09E-03	8.54E-03	7.96E-03
	CO ₃ ²⁻	2.29E-04	2.21E-04	2.39E-04	2.64E-04	2.93E-04	3.35E-04	3.63E-04
	HCO ₃ ⁻	2.20E-04	2.12E-04	1.77E-04	1.39E-04	1.13E-04	9.69E-05	9.21E-05
	H ₂ CO ₃	2.27E-08	2.17E-08	1.40E-08	7.84E-09	4.67E-09	3.00E-09	2.51E-09
	HCN	4.93E-06	1.56E-05	1.17E-04	2.74E-04	4.50E-04	6.54E-04	7.63E-04
	H ⁺	4.44E-11	4.40E-11	3.41E-11	2.42E-11	1.78E-11	1.33E-11	1.17E-11
	OH ⁻	2.25E-04	2.27E-04	2.94E-04	4.13E-04	5.63E-04	7.51E-04	8.55E-04
Complex Concentration (Percentage of Total Copper)	n=1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	n=2	27%	10%	1.1%	0.3%	0.1%	0.0%	0.0%
	n=3	73%	89%	91%	76%	59%	43%	36%
	n=4	0.2%	0.8%	8%	23%	41%	57%	64%
Average n		2.73	2.91	3.07	3.23	3.40	3.57	3.64
Individual Complex Conductivity (Percentage of Total Complex Conductivity)	n=2	11%	4%	0%	0%	0%	0%	0%
	n=3	89%	95%	89%	72%	53%	37%	30%
	n=4	0%	1%	11%	28%	47%	63%	70%
Measured Conductivity (mS/cm)	#1	7.28	7.25	6.86	6.67	6.81	7.29	7.65
	#2	7.29	7.23	6.86	6.68	6.81	7.32	7.70
	#3	7.30	7.21	6.84	6.67	6.80	7.27	7.66
	#4	7.33	7.20	6.87	6.69	6.78	7.21	7.68
Non-Complex Part of Conductivity (mS/cm)		3.62	3.50	3.51	3.79	4.45	5.74	6.65
Complex Part of K (mS/cm)	#1	3.66	3.75	3.35	2.88	2.36	1.55	1.00
	#2	3.67	3.73	3.35	2.89	2.36	1.58	1.05
	#3	3.68	3.71	3.33	2.88	2.35	1.53	1.01
	#4	3.71	3.70	3.36	2.90	2.33	1.47	1.03
Complex Part of K (%)	#1	50%	52%	49%	43%	35%	21%	13%
	#2	50%	52%	49%	43%	35%	22%	14%
	#3	50%	51%	49%	43%	35%	21%	13%
	#4	51%	51%	49%	43%	34%	20%	13%