Table 2: PHYSICAL PROPERTY MEASUREMENTS

	Density & Specific Gravity					Thermal Conductivity
Phase	Binary Mix (L &/or g) OR Sol'n (s or g) in solvent					Gases
Relationship	r = f(composition) @ T & P S.G. = r(ref)/r @ T & P					R = f(T)=f(k)=f(composition)
Equipment	Liquid Column		Displacement (Hydrometer)	Direct Mass Measurement	Radiation-Density Gauges	Thermal Conductivity Analyzer
Measurement	Pressure		Degree of immersion	Frequency of fluid	Gamma radiation inside pipe/vessel	Resistance
Operating Conditions	*Column open to atmosphere	*Closed column	*Constant weight, variable immersion device	* Fluid continuously passing through U-shaped tube	*Detector & source mounted on opposite sides of pipe	*Detector mounted to reference cell and sample cell to determine composition
Comments	*Measure gauge preasure at base	*Differential pressure measurement btwn bottom of column & vapor over column	*Degree of immersion is a measure of density when weight of hydrometer equals weight of displaced liquid	*Tube is at natural frequency *Electrochemical dive strikes peiodically at curved portion * $\Delta f \alpha \Delta r$	*Cesium 137 source for path lengths under 610mm *Cobalt 60 source used above 610mm *Absorbption = f(r)	
Examples	*Manometers to measure pressure or fluid flow		*Alcoholometer determines alcohol strength *Saccharometer measures amount of sugar in solution	*Guitar		*Not ideal for composition detection *Polymers
Advantages	*Easy to set up *Low cost *Able to detect pressure down to 1 militorr		*Accessible operation		*Precise (NMR)	*No inline advantages
Disadvantages	*Not very durable *Portable for rough field applications		*Simple solutions	*Relies on change *Not as precise	*Safety	*Complicated calculations *Low accuracy - calculations depend on many variables (structure and temperature)