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**Effect of Ionic Conductivity of Elevated Pressure TMAHCO3 /MeOH/CO2 Mixtures on Cleaning Efficiency** GALIT LEVITIN, DENNIS W. HESS, Chemical Eng., Georgia Tech — Carbon-dioxide ($CO_2$_based elevated pressure cleaning mixtures are being considered as environmentally benign alternatives for photoresist and plasma etch residue removal in integrated circuit and microelectronic device manufacture. Despite many attractive features, $CO_2$ is non-polar and has little solvating power for photoresist or inorganic materials. Therefore, addition of polar modifiers is necessary. Addition of tetramethylammonium bicarbonate ($TMAHCO_3$) in methanol to $CO_2$ at elevated pressure and temperature (3000 psi, and 70 $^\circ$C) efficiently removes photoresist and post plasma etch residues. Our previous studies of the phase behavior of various cleaning mixtures have demonstrated that the cleaning phase state significantly affects cleaning effectiveness. In this work, measurements of ionic conductivity of elevated pressure cleaning solutions was studied to gain insight into the chemical-physical properties of $TMAHCO_3$ /methanol/$CO_2$ mixtures, and the resulting effect on residue removal efficiency. Ionic conductivity of cleaning mixture gives information on both the behavior of ions in the mixture and the solvation properties of the fluid medium. This work discusses the characterization of the $TMAHCO_3$ /methanol-modified fluids by measuring the ionic conductivity as a function of concentration and mole fraction of $CO_2$ at various temperatures and pressures. The ionic conductivity displays a strong dependence on the dielectric properties of the fluid medium.

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