Ionic Liquids (ILs) have been successfully used as solvents for various reactions, but the separation of products and catalysts remains an issue. Previously, our group has shown that CO$_2$ can induce a liquid-liquid phase split with IL/organic mixtures [1], extract solid solutes from ILs [2], and precipitate solid solutes from IL/organic mixtures [3]. Here we investigate the effects of different organics to understand the specific interactions that dominate IL/organic mixtures. The lower critical endpoint (LCEP), the CO$_2$ pressure required to induce a liquid-liquid phase split, is one measure of the antisolvent ability of CO$_2$. We complement this with measurements of the solvent strength of IL/organic/CO$_2$ mixtures using spectroscopic probes. Previously, we used the Kamlet-Taft parameters to show that the solvent strength of ILs are not influenced by CO$_2$, even at high pressures [4]. Here, we expand upon our previous work to understand the solvent strength of binary and ternary mixtures of ILs with high pressure CO$_2$. In particular, we present Kamlet-Taft parameters for organic/IL, IL/CO$_2$, and organic/IL/CO$_2$ systems. In addition, the solvatochromic probe Acetylacetonato-$N,N,N’$-tetramethylethylendiaminocopper(II) tetraphenylborate ([Cu(acac)(tmen)][BPh$_4$]) has a structure similar to that of organometallic catalysts. We use CO$_2$ to precipitate this probe from IL/organic mixtures, while examining the effects of the solvent strength at the same conditions. The ultimate goal is to develop a correlation between the solvent strength and the antisolvent ability of CO$_2$ to allow for the selection and design of IL/CO$_2$ systems for reactions, as well as for product and catalyst separations.