

## Dielectric Characterization of Pigment Inks for Jet Printing

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This paper presents a dielectric method of characterization that could be useful for evaluation of the ink performance in jet printing for inks containing pigment particles and polymer (stabilizer for pigments) and having low viscosity and small elasticity. Depending on the medium suspending the pigments, hydrocarbon for oil-based inks and glycol ether for polar solvent-based inks, as well as the type of pigments (exhibiting different colours), vast differences were found for the dielectric property even when the viscosity of each ink was almost identical. At low angular frequencies ( $\omega$ ), all inks exhibited the electrode polarization characterized with  $\omega^{-1}$  dependence of the dielectric loss  $\varepsilon''$  and upturn of the dynamic dielectric constant  $\varepsilon'$ . However, the  $\varepsilon''$  value was much smaller and the low- $\omega$  upturn of  $\varepsilon'$  was much less significant (occurred at lower  $\omega$ ) for the oil-based inks than for the polar solvent inks. These differences between the two series of inks were related to differences of the ion concentration  $n$  and ion mobility  $\mu$  estimated from analysis of the complex dielectric constant  $\varepsilon^* (= \varepsilon' - i\varepsilon'')$ ;  $i = \sqrt{-1}$ ) on the basis of Macdonald theory.