

Highly Dispersible Kaolin for Printing Inks

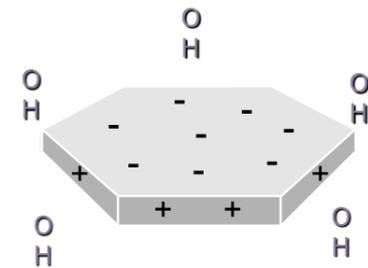
A Elton-Legrix, A Curtis, Imerys Minerals Ltd



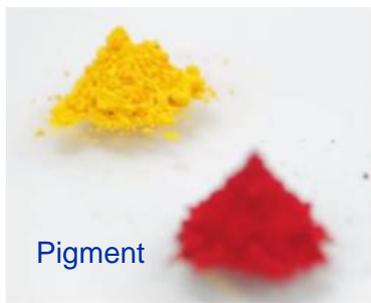
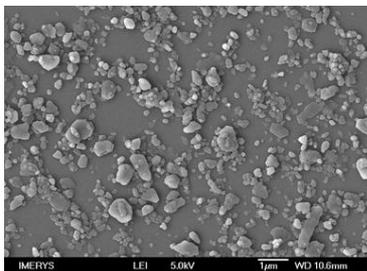
Particle Dispersion in Liquid Formulation
16th Dec. 2020

Problem to Solve

- How to re-disperse fine hydrophilic kaolin plate-like particles into solvent based system eg. offset heatset inks to obtain high printing gloss
- Reduced amount of aggregates -> mechanical solutions (eg. milling)
- Low amount of agglomerates and ease of dispersion -> chemical solutions



Kaolin



Pigment

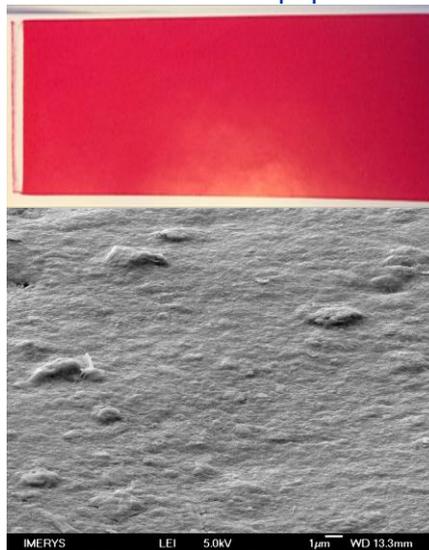


Ink varnish

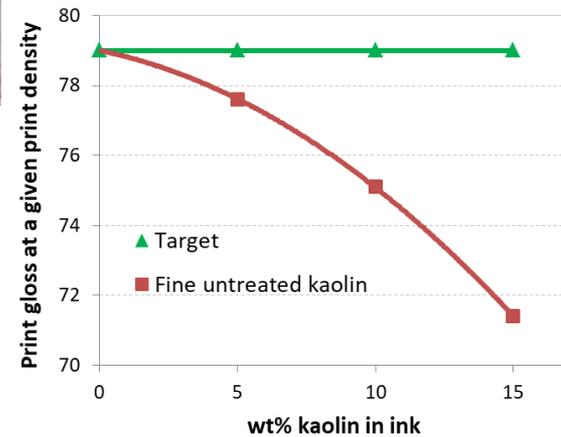
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Printed ink on paper

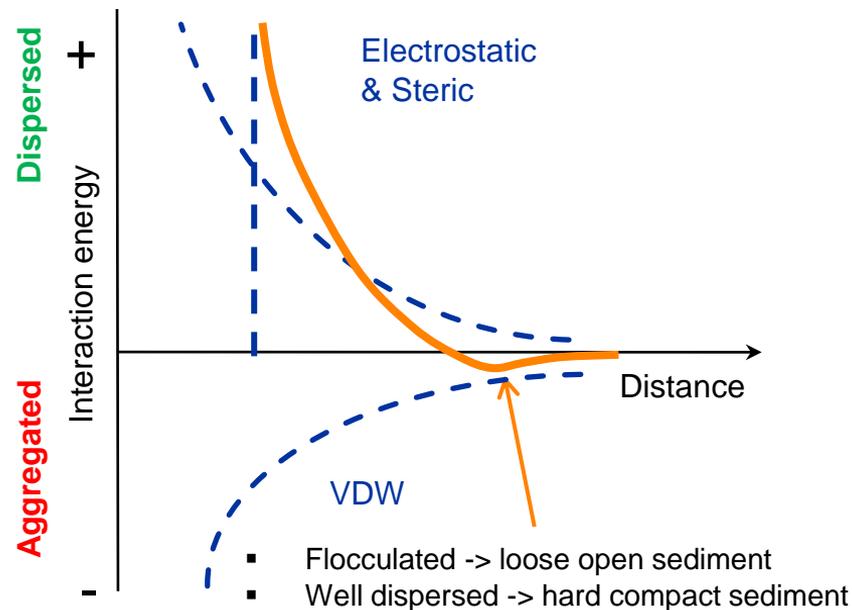
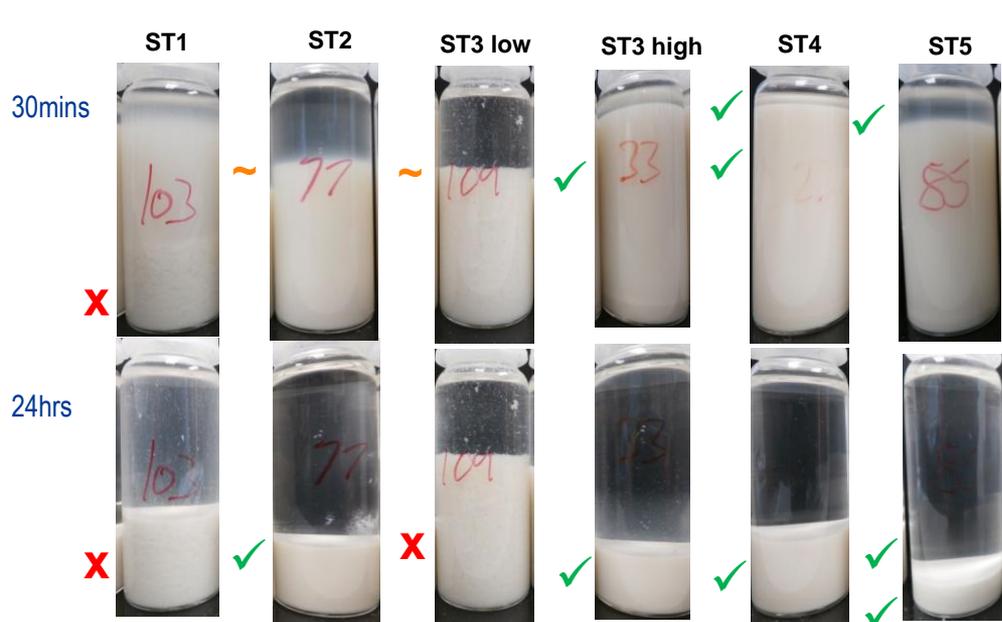


SEM tilted image of printed ink



Solutions for Improved Dispersion

- Interest in long alkyd chain primary amine and more bulky amine to improve dispersion in solvent based system
Zhang Y. et al. Nonaqueous Suspensions of Surface-Modified Kaolin, Langmuir 2007, 23, 3424
- Screening of various kaolins and different surface treatments (nature and dosage) using simple dispersion test of 10wt% kaolin in ink distillate

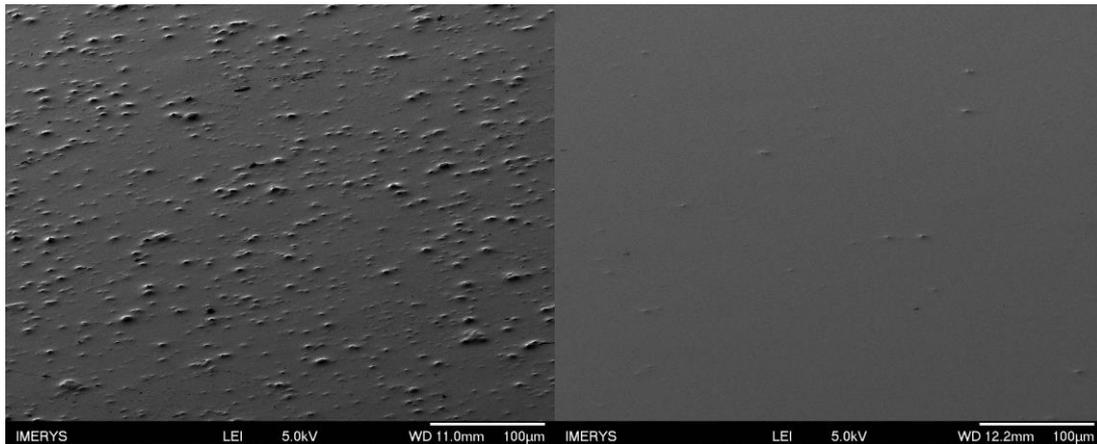


Summary

- Confirmation of good dispersion in varnish with optimally treated kaolin (glossy printed surfaces)

Coarse particles or Insufficient dispersion

Well dispersed ultrafine kaolin



- Additional considerations:
 - health and safety hazard of the treatments
 - viscosity for ease of addition onto dry kaolin
 - overall optimisation of cost performance
 - Interest in blends of long chain and bulky amines:
[Leach E.H.S et al. Nonaqueous Suspensions of Laponite and Montmorillonite, Langmuir 2005, 21, 3821](#)

Acknowledgements:

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Thank you

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