

Transport of impurity & residual solvent during static drying

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Introduction

PROBLEM STATEMENT - The unwanted chemicals (organic, inorganic impurities, and residual solvent) that remain within the API are termed impurities and may influence the stability and safety of pharmaceutical products.

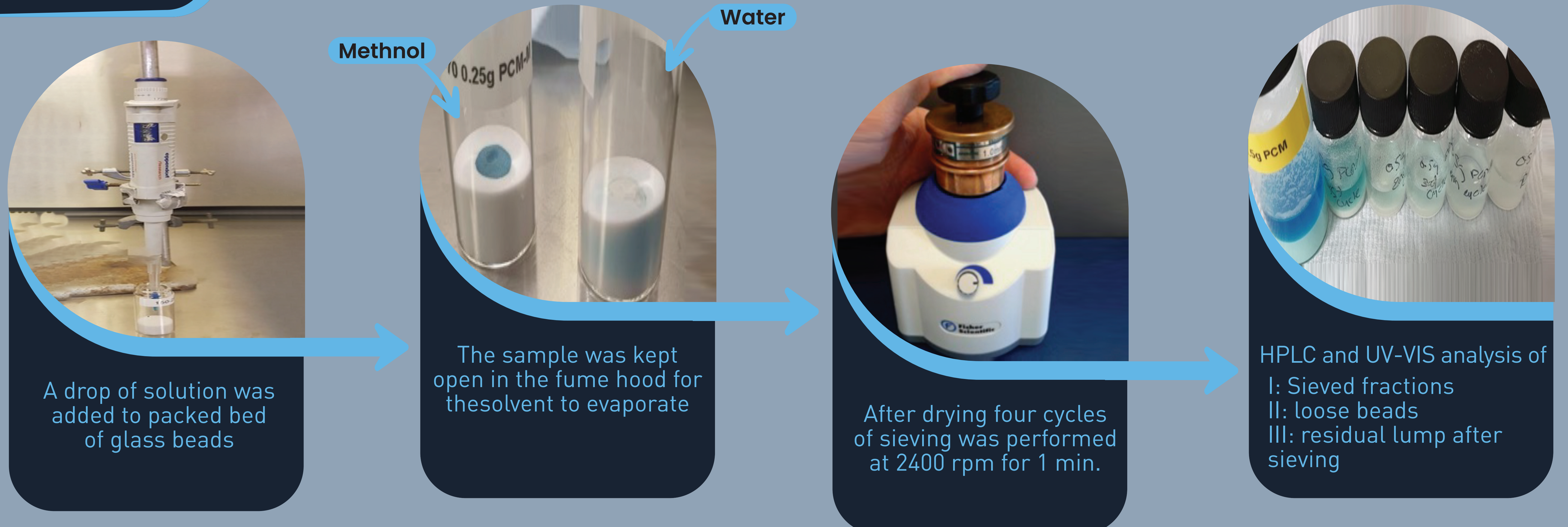
AIM - Investigate the transport mechanism of residual solvent and other impurities through the cake during drying.

OBJECTIVE - Evaluate the relative transport of and API (paracetamol PCM, potassium hydrogen-L-tartrate PLT) and impurities (a blue dye for visual tracking along with residual solvent (water or methanol) during static drying.

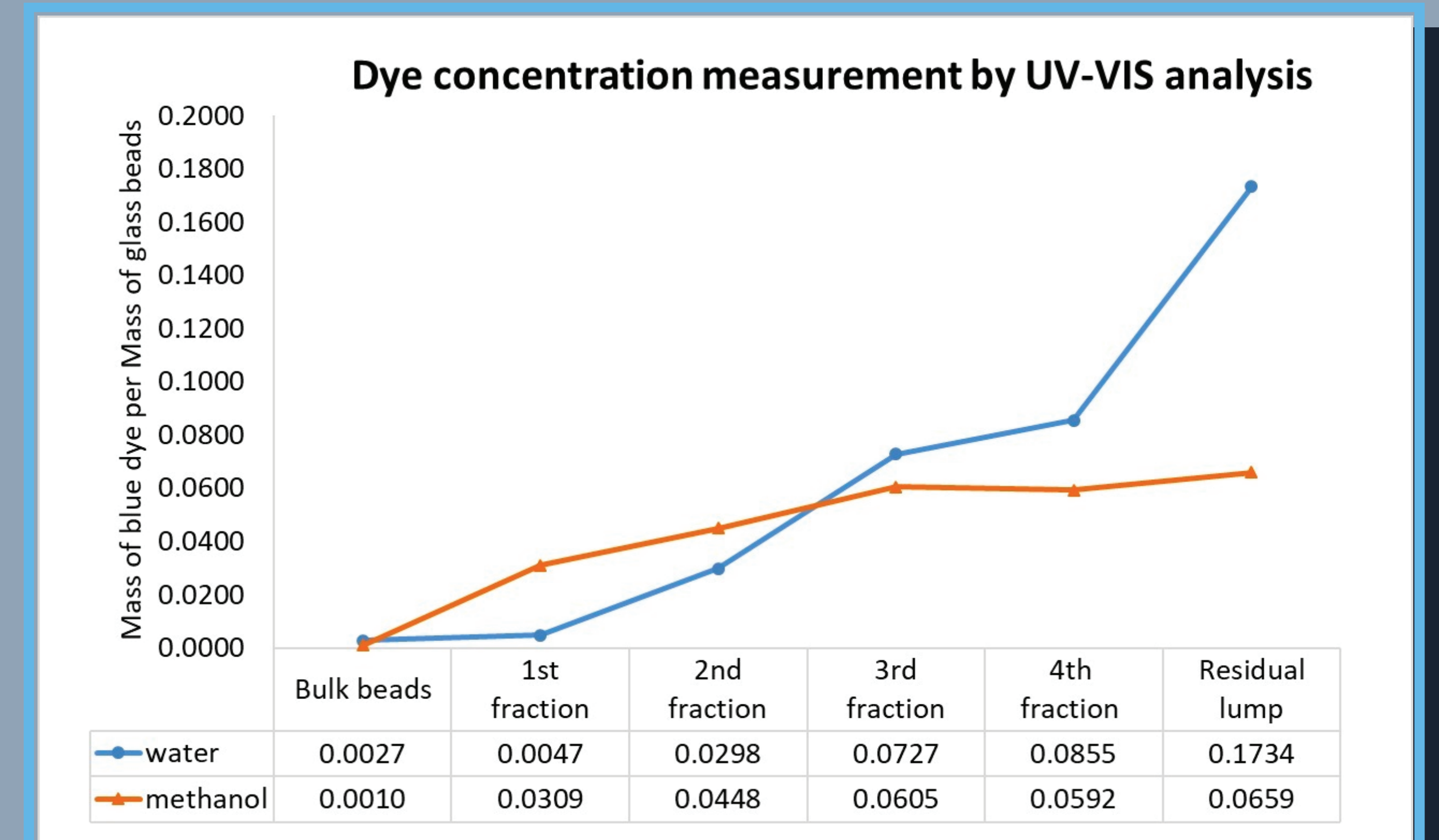
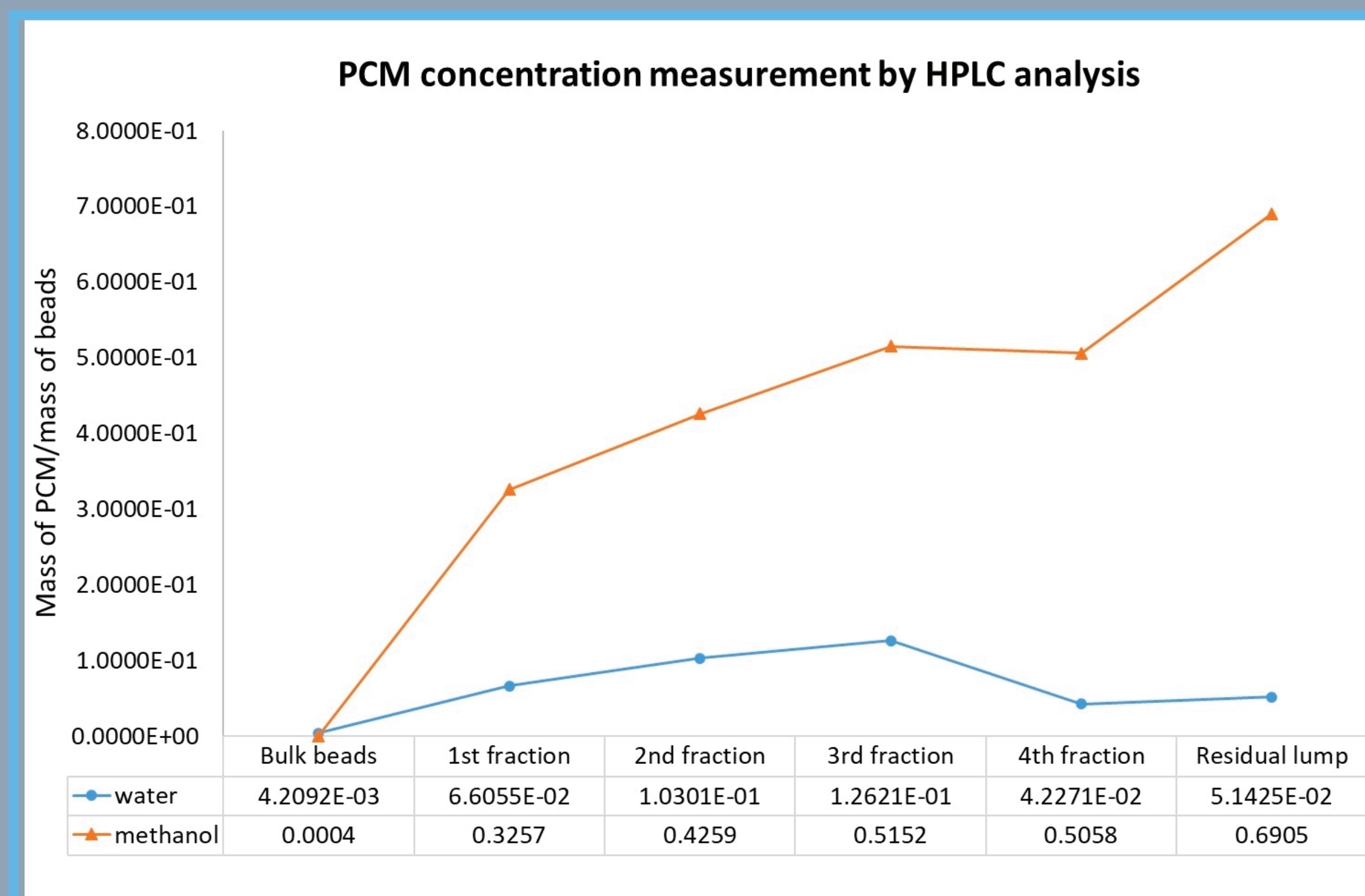
PRIOR KNOWLEDGE - Different solutes and solvents show different transport mechanisms depending on wettability.

METHOD - Static drying, microscopy for imaging, HPLC and UV-VIS analysis to track concentration profiles, and the Washburn method for wettability and contact angle measurements.

Method



Results

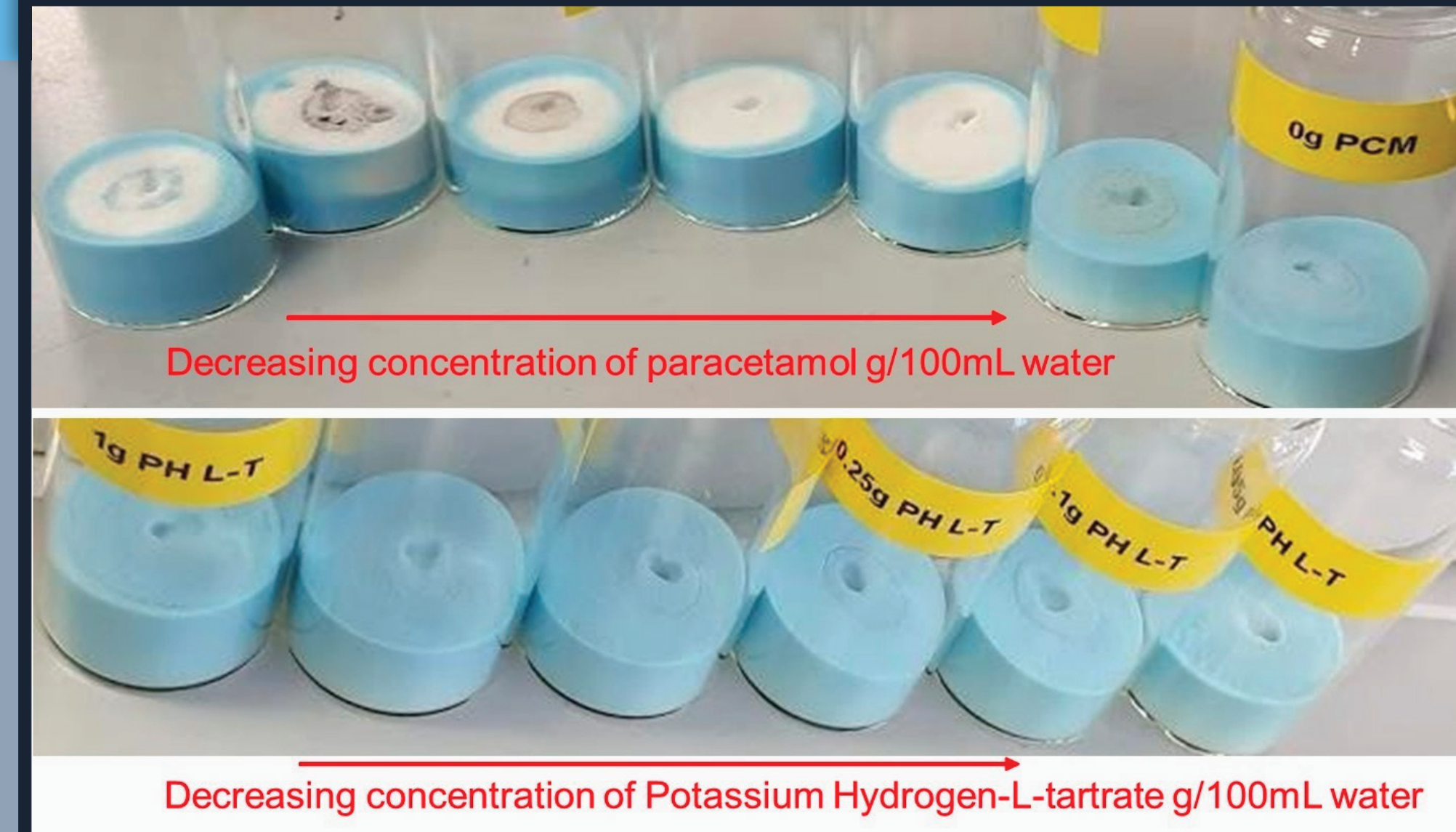


Further Work

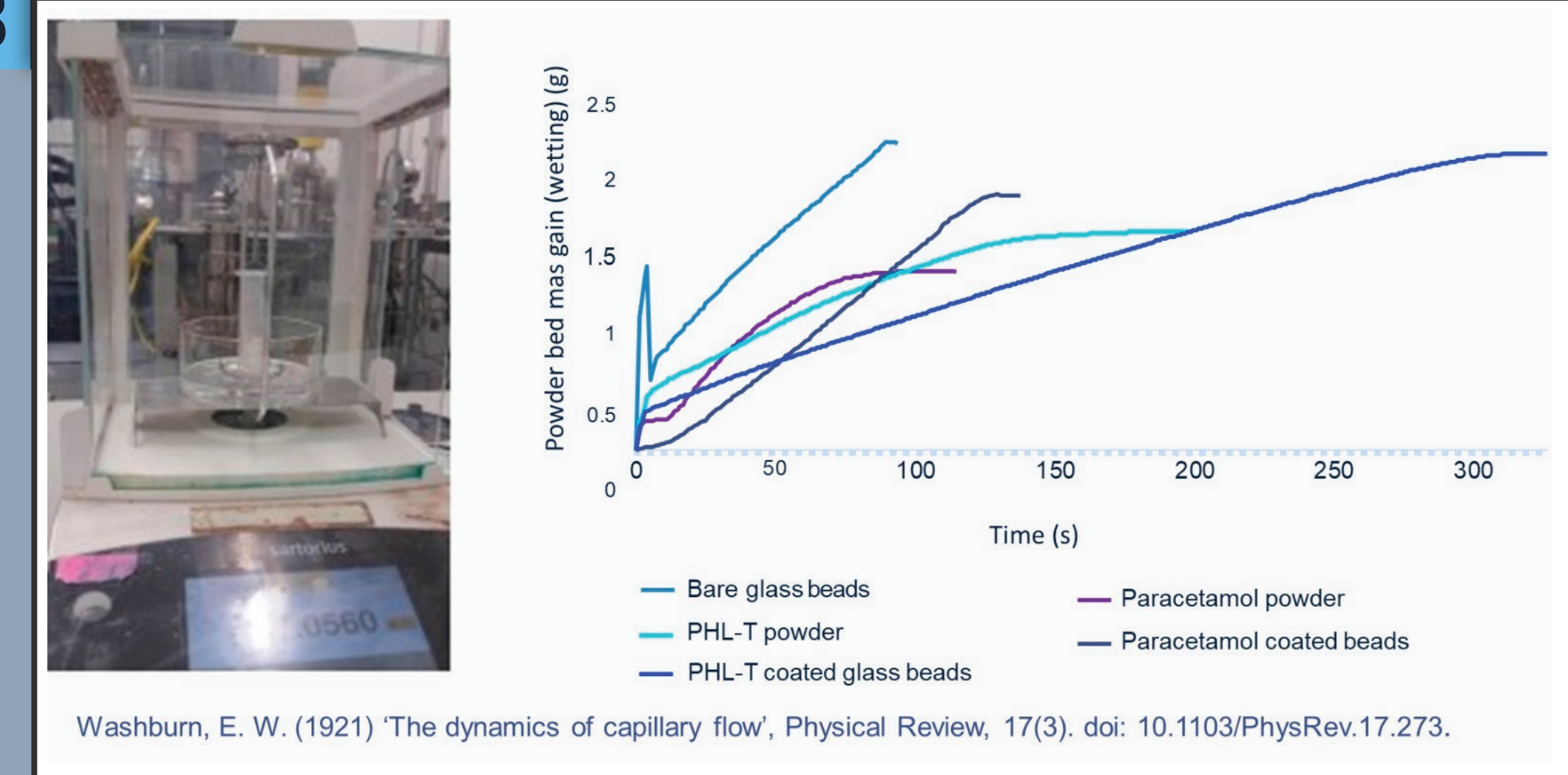
1 what happens with solvent mixtures?



2 For different solute concentrations and different solutes?



3 Washburn method



Conclusion

- Analyses to track the transport of solution with methanol indicates that the highest concentration of PCM and dye were in the residual lump remaining after four sieving cycles.
- For water, the highest concentration of PCM was in the residual lump remaining after four sieving cycles and the dye concentration spreads away from the lump formed.
 - Possible hypothesis
 - Methanol evaporates and escapes directly
 - Perhaps water evaporates, re-condenses and evaporates again?