

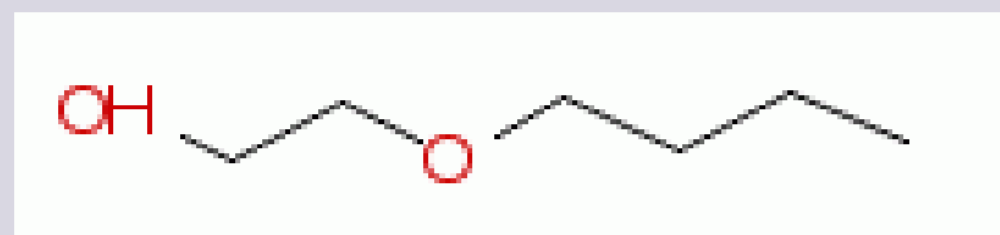
Mutual Solvent Analysis by GC-FID and Infrared Infracal CVH Measurements

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Significance of Research

Having the ability to analyse for mutual solvent concentrations in different phases returning during an experiment is extremely beneficial. The different phases being either an aqueous, an oleic or a transitional phase. By monitoring the partitioning of the mutual solvent into the different phases allows experimental mechanisms to be investigated in more detail.

The main mutual solvent in question at the moment is EGMBE, 2-Butoxyethanol

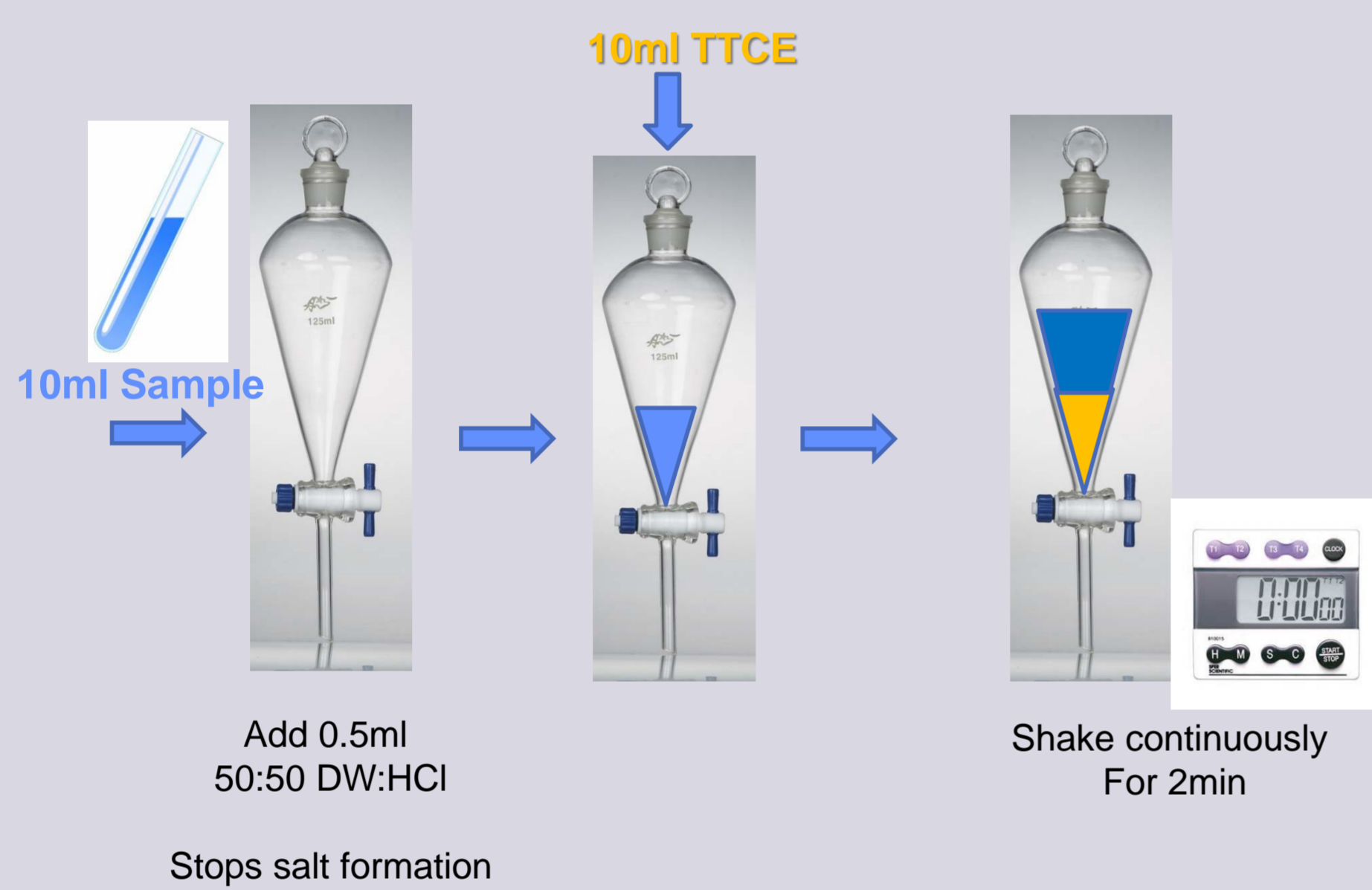


but there are many others that are available and will be investigated in time.

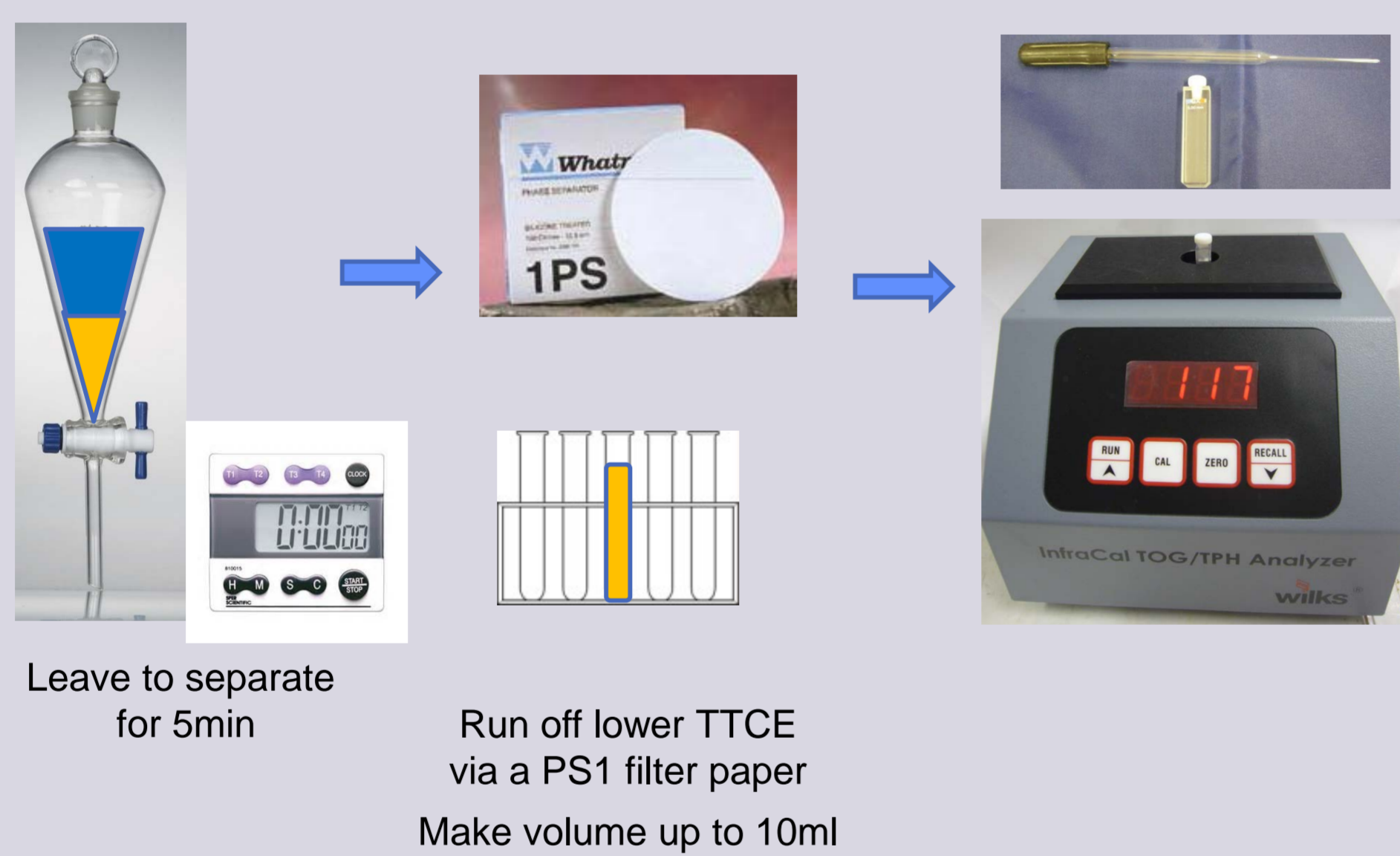
General Procedures & Equipment

INFRACAL:

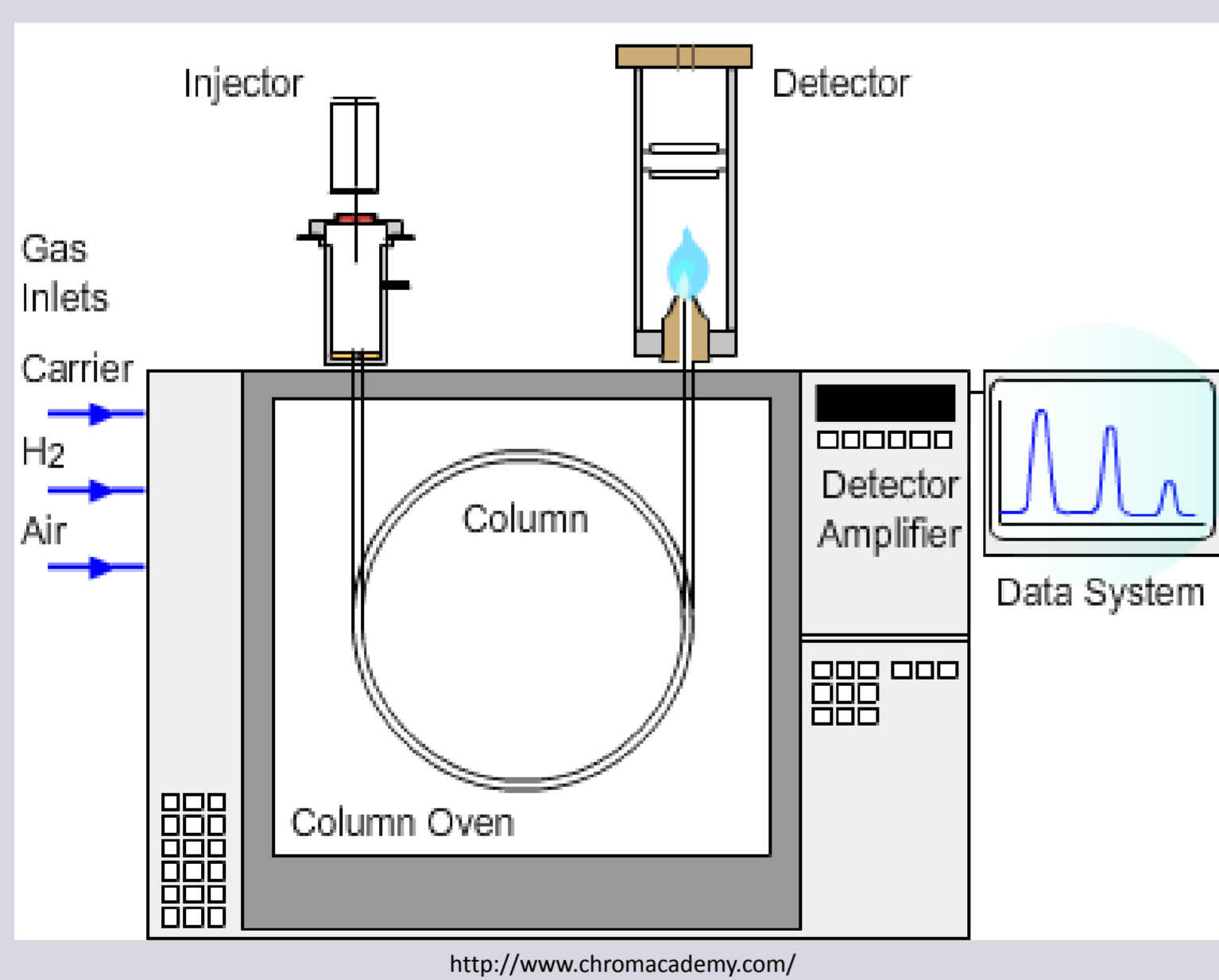
Step 1



Step 2



GC-FID:



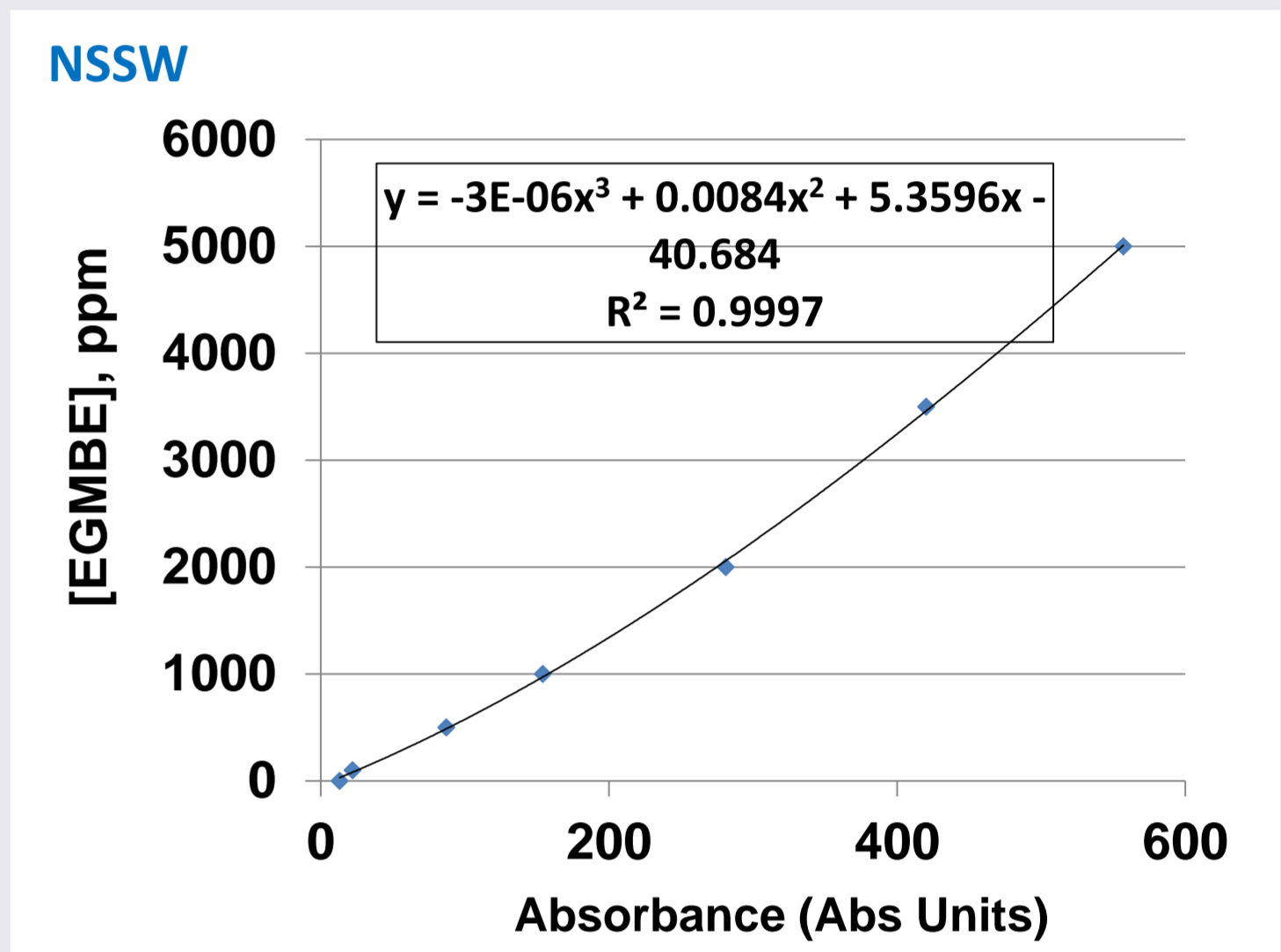
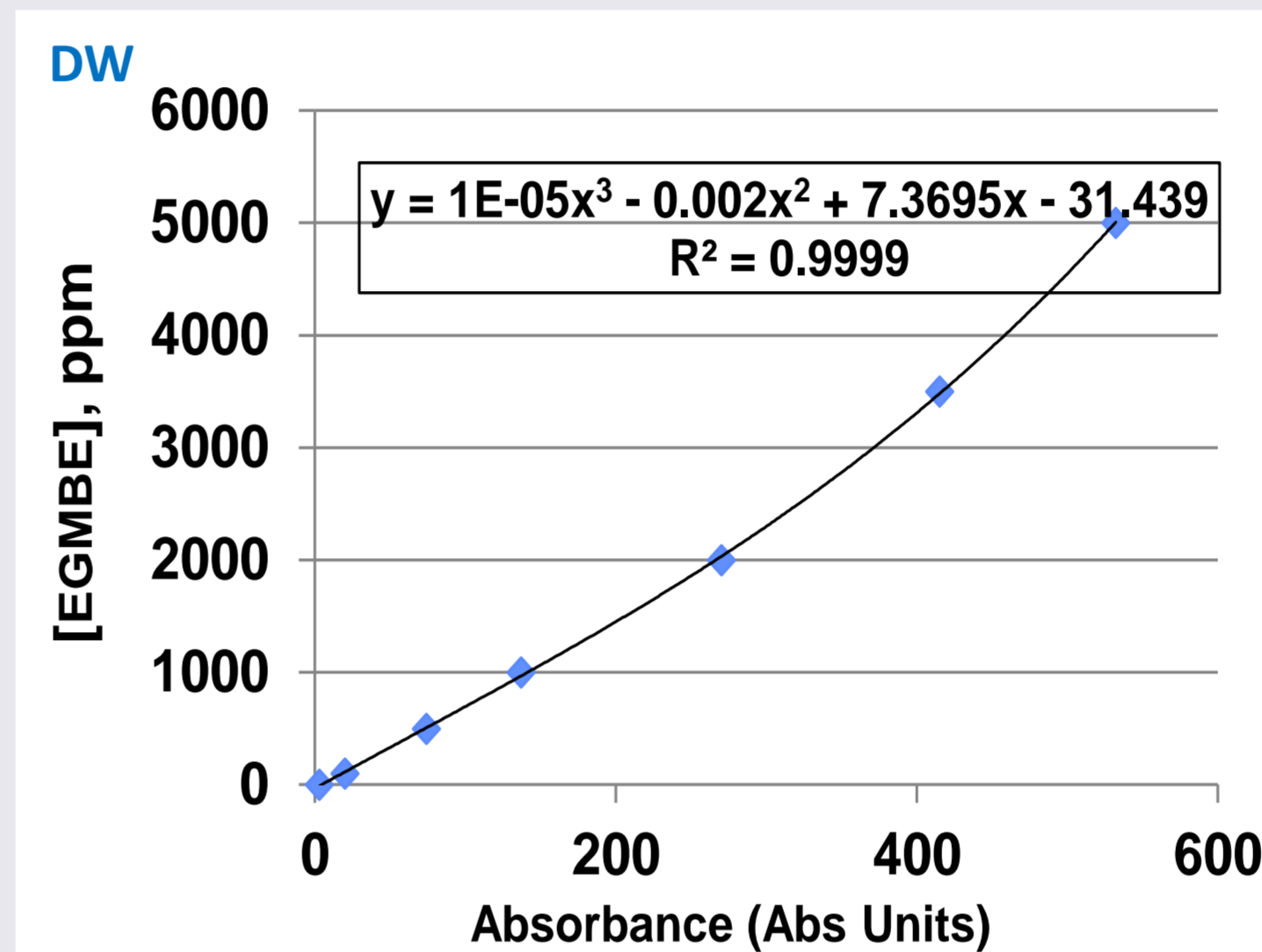
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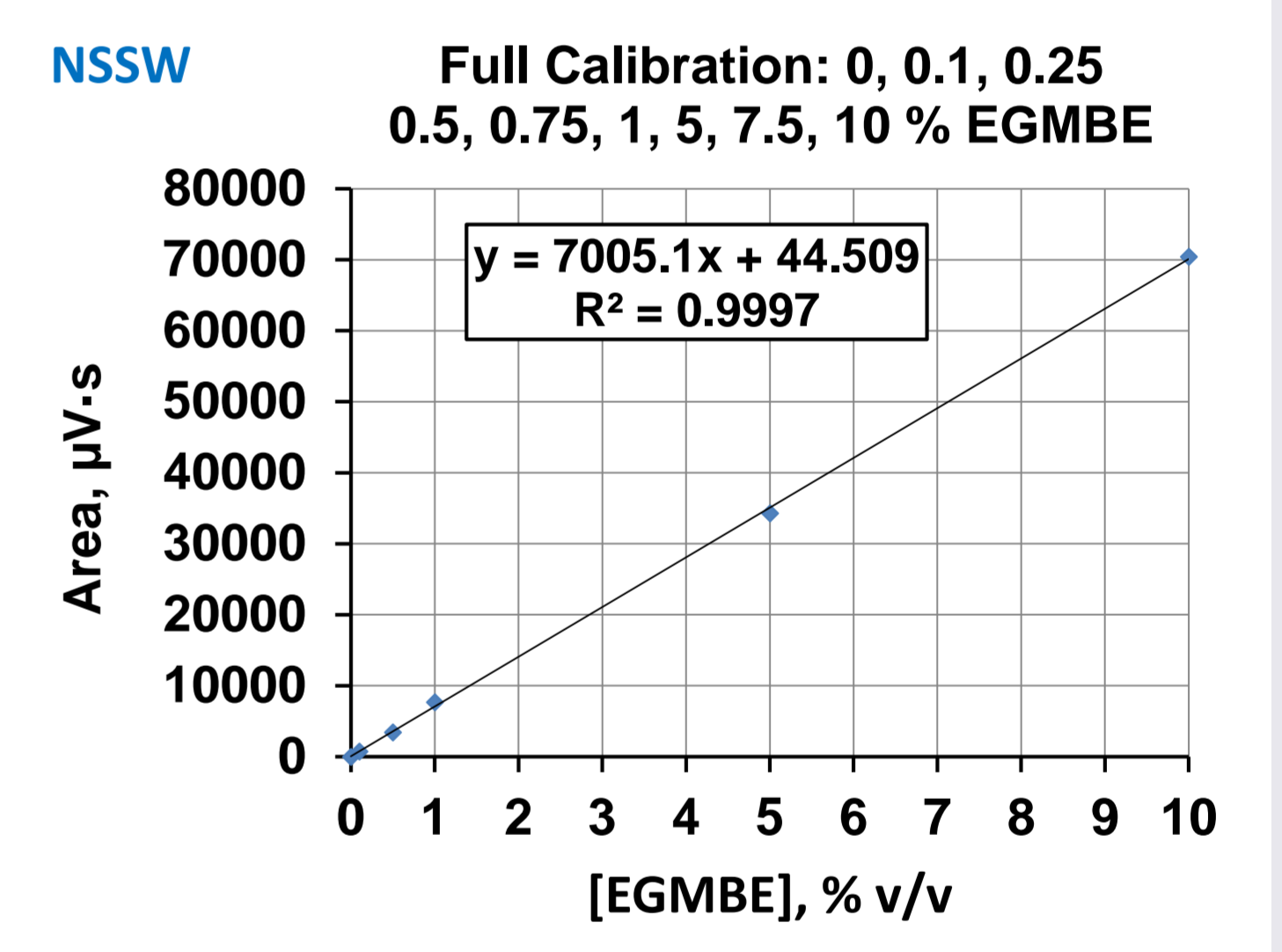
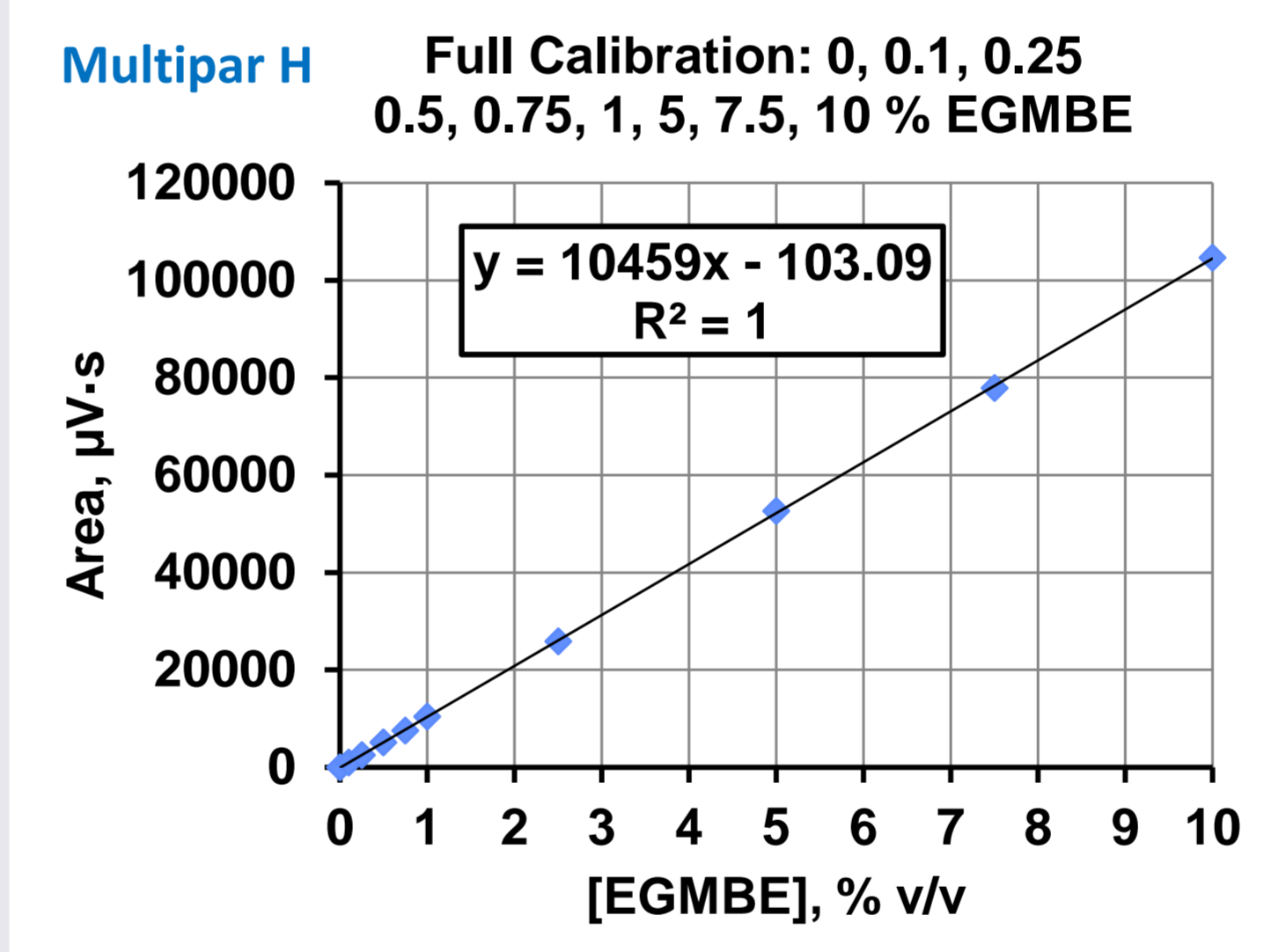
Introduction

Mutual solvents are non-ionic surfactants, which have the characteristic property of solubilising in both oil and water. As part of scale inhibitor (SI) squeeze treatments, mutual solvents are applied at the pre-flush stage for emulsion prevention, oil displacement and formation rock conditioning. Their application is also thought to enhance SI adsorption by: 1. Enhancing the water wetness of the rock surface, hence facilitating transport of the SI from the bulk to the rock surface and 2. Increasing the surface area of the rock. This has the practical and economic benefit of reducing the frequency of squeeze treatments due to enhanced SI return profiles, and hence improved squeeze lifetime.

INFRACAL: EGMBE Calibrations



GC-FID: EGMBE Calibrations



Conclusions

1. Can analyse for EGMBE concentrations: Infracal - DW & NSSW backgrounds, GC-FID - DW, NSSW & Multipar H
2. Good repeatability observed
3. Infracal: Further experiments for a 3 phase system, allowed concentrations of EGMBE to be determined in the NSSW phase which were in agreement with model prediction
4. Investigating removal of Multipar H (oil background) so it does not interfere with Infracal measurement - pH7 C18 SPE pass
5. Some EGMBE removed using a pH7 C18 pass but remains in concentrations that can still be calibrated

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References: Wilks Enterprise Inc. www.wilkslr.com
Crawford Scientific www.chromacademy.com