

ESDU-SPA-M12-2



Sept.09: Application of ATR-FTIR imaging to study precipitation due to heating of crude oil

**Unamended
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**Imperial College
London**

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Application of ATR-FTIR imaging to study precipitation due to heating of crude oil

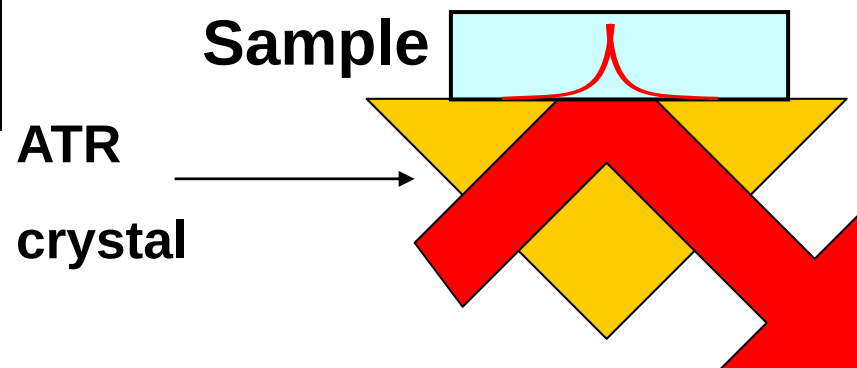
CROF Meeting Sept 2009

Presented by: Feng H Tay

Supervisor: Prof. Sergei Kazarian

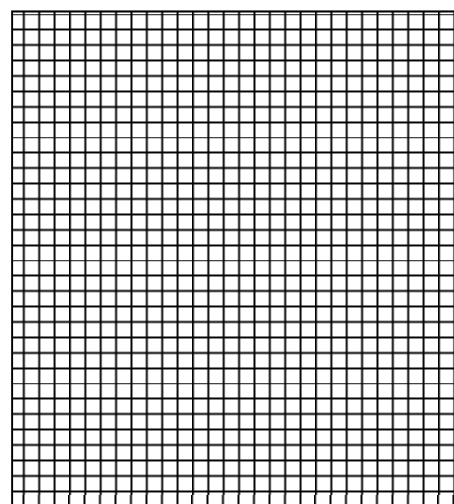
<http://www3.imperial.ac.uk/crudeoilfouling>

attenuated total reflection (ATR) - FTIR imaging



$$d_p = \frac{\lambda}{2\pi \cdot (n_1^2 \sin^2 \theta - n_2^2)^{1/2}}$$

$$d_p \sim 0.3 - 4 \mu\text{m}$$



64 x 64 or 128 x 128

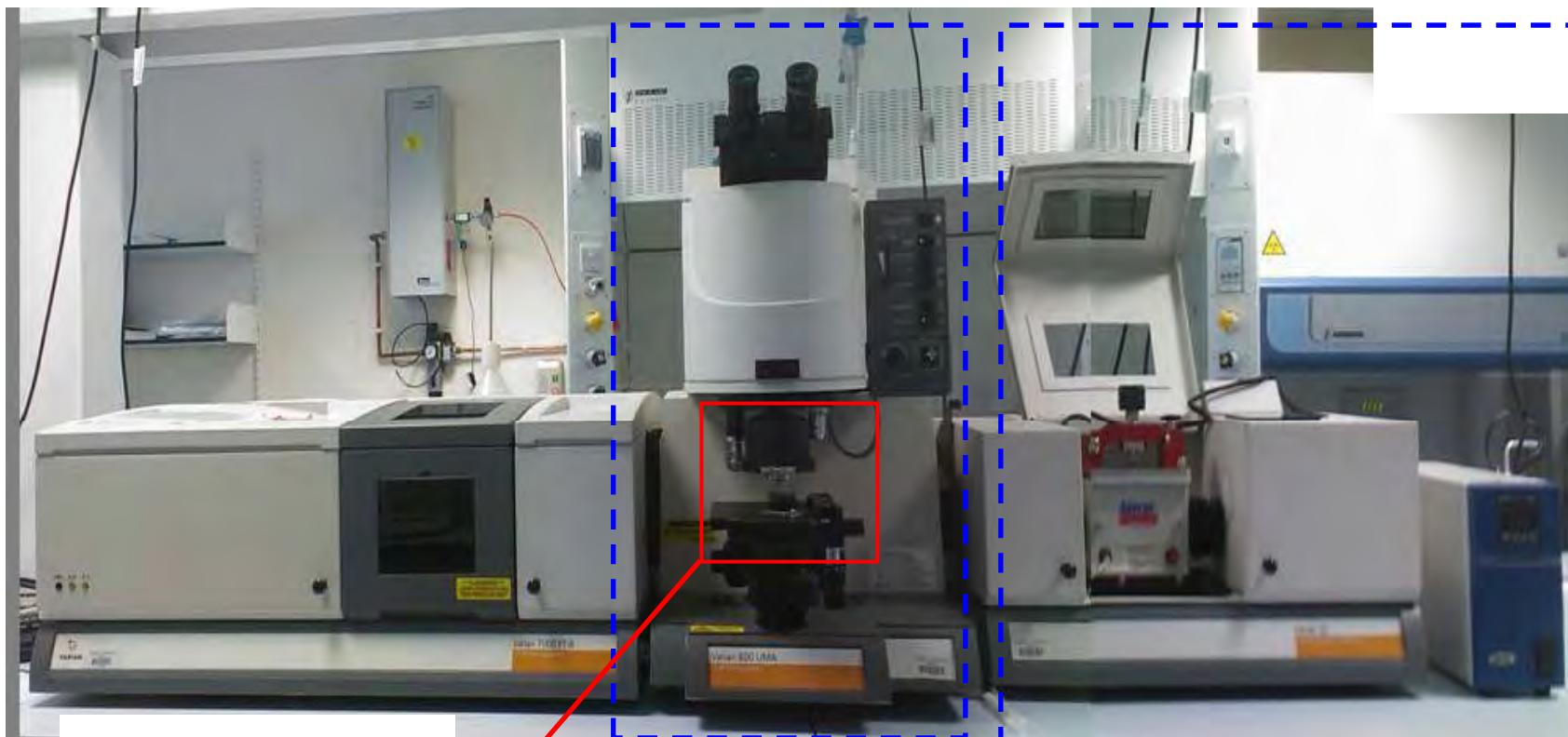


Diamond ATR accessory

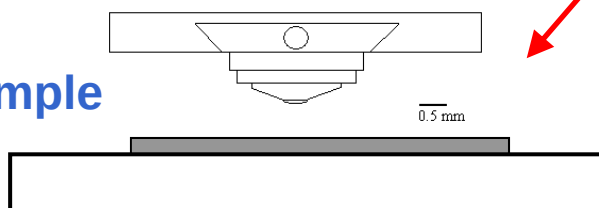
Burka and Curbelo (Varian), US Patent 6,141,100 (2000)

Tay, F. H.; Kazarian, S. G., Study of petroleum heat-exchanger deposits with ATR-FTIR spectroscopic imaging. Energy & Fuels 2009, 23, 4059-4067

FTIR imaging system



Sample



Micro ATR imaging

Macro ATR imaging

Germanium micro-ATR accessory

<http://www.mettler.com>