**“In a little you can see a lot”: Variety and impact of practical microscale chemistry**

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Practical microscale chemistry has made little impact on teachers in the United Kingdom who have, for over a hundred years, supervised and carried out for over 120 years, normal scale practical experiments safely, due to the expertise in teachers trained in traditional chemistry techniques and trained technicians. These trained personnel are sadly declining in numbers and there has been a reduction of practical work as teachers are teaching to the test.

Other factors such as cost, safety and environmental reason are also now becoming more important. CLEAPSS introduced microscale techniques initially for safety reasons but now we are seeing added benefits such as improved classroom management, reducing cognitive load on the short term-working memory, challenging long-held misconceptions with regard to chemistry at the molecular/ionic level and even developing completely new experiments for students and demonstrations for teachers.

Now the Examination Boards are taking these techniques on board which adds extra gravitas. This presentation will summarize this “added value” with live demonstrations such a catalytic cracking an the microscale Hofmann voltameter. There will also be a workshop for visitors to try at first hand microelectrolysis, diffusing precipitates and microtitration, The procedures have been collected and adapted from the support and work of various enthusiasts of micro and small scale chemistry around the world such as Bruce Mattson[[1]](#endnote-1) David Katz[[2]](#endnote-2) (US) Jorge Ibanez (Mexico), John Bradley (South Africa) and many others.

With modern, yet inexpensive, IT facilities there are still plenty of wonderful images[[3]](#endnote-3) to inspire students and present images that require subtle, yet important, interpretation.

CLEAPSS[[4]](#endnote-4) consists of a small group experienced science teachers, financed by subscription of employers and independent schools that works closely with the Department for Education and the UK Health & Safety Executive, to ensure that teachers, school technicians and students work safely during science practical lessons. In order to minimize risk and reduce costs both in monetary and environmental terms, and in compliance to EU and UK safety law, CLEAPSS has pioneered new and novel procedures in all sciences.

UNESCO[[5]](#endnote-5) promoted microscale techniques from John Bradley in over 70 countries, to involve children in practical work where there are few laboratory facilities. Now we can see that these techniques have much to offer too all teachers of chemistry

1. <http://mattson.creighton.edu/Microscale_Gas_Chemistry.html> [↑](#endnote-ref-1)
2. <http://www.chymist.com/> [↑](#endnote-ref-2)
3. [www.microchemuk.weebly.com](http://www.microchemuk.weebly.com) [↑](#endnote-ref-3)
4. [www.cleapss.org.uk](http://www.cleapss.org.uk) [↑](#endnote-ref-4)
5. [http://portal.unesco.org/science/en/ev.php-URL\_ID=6811&URL\_DO=DO\_TOPIC&URL\_SECTION=201.html](http://portal.unesco.org/science/en/ev.php-URL_ID%3D6811%26URL_DO%3DDO_TOPIC%26URL_SECTION%3D201.html%20) [↑](#endnote-ref-5)