

A number of issues relating to the use of mercury in schools have recently come to light and which need some clarification.

In September's School Science Review (SSR) [1] it was stated that mercury in schools is banned.

The ASE Safeguards Committee, on which SSERC is represented, has written to the SSR to assure them that it is not. Through SSERC SafetyNet [2], we advise that wherever possible you try to find an alternative but if there is none then you may continue using mercury as recommended in the Uses & Control Measures [3].

There was an incident in a Scottish school recently where a mercury thermometer fell off the wall where it was mounted and the bulb broke, spilling the mercury. Although the amount was very small it still had the potential to form concentrations of toxic vapour in the atmosphere which would be many times more than is safe. Matters were complicated by the fact that, having broken on a carpet, it was not cleaned up properly. Problems were further compounded when a school cleaner then used a vacuum cleaner. Not

only did this risk spreading the mercury more widely, it meant that the vacuum cleaner had to be disposed of as well as the carpet.

We would therefore remind everyone that any mercury spillage, no matter how small, should be cleared up carefully as advised on the SSERC website [4]. Furthermore, we would suggest that it is not a good idea to have mercury-containing devices mounted on walls in classrooms (or elsewhere in schools) and that any should be replaced with devices not containing mercury.

Perhaps a reason for the premature announcement in the SSR is the consultation that is taking place by ECHA (European Chemicals Agency) on behalf

of European Commission regarding the banning of mercury in measuring devices within the EU. The consultation closes on 24th December but it seems almost certain that such a ban will indeed come in to force in 2014. You can view a summary of the proposals [5] or if anyone has time on their hands and wishes to read through the full proposals on the ECHA website [6].

The main impact for most schools will be on mercury usage in thermometers and barometers. There may be a delay in implementation of the regulations for these devices but, even if not, there are no plans to force establishments to dispose of mercury containing devices they already possess. It will merely be impossible to buy new ones.

References

- [1] School Science Review, *Faraday's rotating wire – the homopolar motor: time to update?* by Geoff Auty, September 2010, Vol.92, No. 338, p116.
- [2] <http://tinyurl.com/HazChem-mercury>
- [3] <http://tinyurl.com/HazChem-UCM-mercury>
- [4] <http://tinyurl.com/HazChem-spillage-mercury>
- [5] http://echa.europa.eu/doc/restrictions/info_note_hg_in_measuring_devices_en.pdf
- [6] http://echa.europa.eu/doc/restrictions/annex_xv_restriction_report_mercury_en.pdf

► Figure 6 – Doppler Effect formula

Where:

f is the observed frequency
 V is the speed of sound
 V_S is the speed of the sound source
 f_S is the frequency of sound emitted by the Doppler Ball.

This can be used to estimate the speed of the ball as it approached the microphone. Other methods can be used to verify this speed, for example conservation of energy.

Note that a Doppler Ball gives out a fairly pure tone. We have yet to try this experiment with a buzzer unit but suspect that the tone produced might be too messy to use.

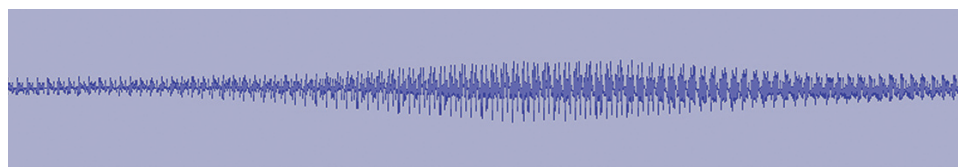


Figure 4.

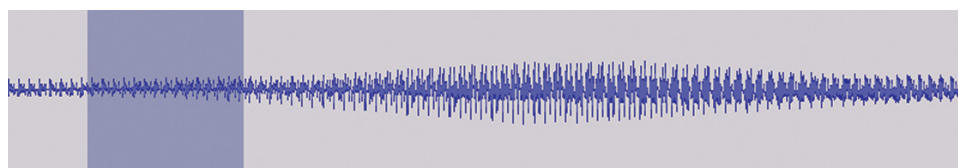


Figure 5.

References

- [1] <http://tinyurl.com/Higher-Pitched>
- [2] http://www.sserc.org.uk/members/SafetyNet/bulls/218/Audacity_intro.htm
- [3] Lascells Doppler Ball, available from Timstar, product code SO76360, Instruments Direct, product code PH103240 - http://www.indes.co.uk/physics/doppler_ball.htm