How Does Dubai Police Use Nanoscale Forensics?

The use of forensics in police work stretches back almost two centuries. As our understanding of forensic science has advanced, so too has its deployment in criminal investigations. Today, incredible progress in this field has facilitated the use of nanoscale forensics to help solve cases, secure convictions and rehabilitate criminals.

Dubai Police have been at the forefront of this particular discipline for several years now, with applications including nanoscale sensing and odour fingerprinting. Due to the microscopic nature of the particles involved, nanoscale forensics is capable of reinforcing theories and providing supporting evidence for prosecutions in a way that traditional police work simply cannot.

What is nanoscale forensics?

In essence, nanoscale forensics refers to the use of nanomaterials in forensic investigations. A nanomaterial is the name used to describe any particle between one and 100 nanometres in length. For reference, a single nanometre is equivalent to one billionth of a metre, meaning we are dealing with evidence on an extremely small scale.

At such small measurements, substances have a knack of behaving very differently than they might en masse. By studying these tiny materials in closer detail, we can better understand how they function in a given situation, thus allowing us to draw more reliable conclusions and unravel difficult criminal intrigues.

Sniffing out crime

One particularly innovative use of nanoscale forensics has seen investigators develop the concept of odour fingerprinting. When broken down into their constituent parts, human odours are comprised of a variety of chemicals and volatile organic compounds (VOCs), the combination of which can be unique to a single person.

As such, the use of sophisticated techniques such as gas chromatography combined with mass spectrometry (MS-GC) can help to identify particular compounds and link them to the odour exuded by an individual. This can be used to place a suspect at the scene of a crime, even when other more traditional evidence (such as DNA or fingerprints) is lacking.

A variety of uses

Odour imprints are certainly a fascinating application of nanoscale forensics, but they're far from the only one. Indeed, the use of nanomaterials as a sensing agent is much more

established and commonplace in Dubai policework. By using specific particles as binding agents for targeted molecules, police can determine the presence of those molecules in even the most complex of solutions, such as biological samples.

For example, a certain nanomaterial can be used to identify whether any narcotic substances are present in a person's bloodstream, urine or other biological sample, even if it can only be found in trace amounts. As well as securing a conviction for taking a prohibited substance, the practice can also be relied upon to help rehabilitating addicts leave substance abuse behind.