

A matter of chemistry

Chemists are in demand in many industries but getting your foot in the door can be difficult. **Alaina G. Levine** hears the stories of those who already have a track record

Andrew Trapani, polymer developer

We all know watching paint dry is a tedious affair. Designing polymers to make paint more environmentally friendly, however, is another matter entirely. “Paint can seem very ordinary, but in reality it is a great place to put chemistry to work,” says Andrew Trapani. “Paint science pushes you to understand the macro and micro levels that are interacting, and the challenge of putting all that together can be very satisfying.”

As a technical director at Dow Coating Materials, a subsidiary of the giant Dow Chemical Company, Trapani spends more time than most peering into vats of coloured chemicals. For him, the word “coating” covers a multifaceted array of surface materials designed to protect, preserve and even embellish objects and structures. They can include anything from common paints and enamels to complex surface finishes used to

make semiconductors and solar cells.

Trapani, who has a doctorate in physical chemistry from the University of California, Berkeley, leads a research group at the company’s technical centre in Valbonne, France, responsible for innovation and customer support. His customers are paint companies in Europe, the Middle East and Africa, and the innovations he develops and promotes are technologies that improve paint – for example, by reducing its toxicity or carbon footprint, or by making it go further.

Paint has four core constituents – pigments and fillers, which colour and thicken it; polymers, which act as binding agents; and a solvent. Trapani works on the polymers, designing experiments with his team to create formulations that meet customer needs as well as basic safety and quality criteria.

One of the big projects he has been involved with recently is the introduction of a product



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Dominic Graham, head of technical and professional recruitment at Kelly Services, UK

What fields are generating a lot of excitement?

We are seeing a lot of chemistry jobs in emerging sectors – coatings, printed electronics, display technologies and green plastics. The jobs are in R&D as opposed to quality assurance and quality control. We are also seeing a greater need for chemists in “performance” industries,

such as lubricants. Here chemists are involved in removing pollutants and reducing waste – essentially making the process more cost-effective.

Which traditional sectors are good prospects for chemists?

Big pharma is still hiring. Contract research organisations are becoming more prevalent as a lot of the pharmaceutical companies are increasingly outsourcing their clinical trials to CROs. Other sectors recruiting include food, and fast-moving consumer goods (FMCG), an industry that includes companies like Unilever.

What qualities are these companies looking for?

Usually they’re looking for chemists who can show aptitude more than simply qualifications. At the higher levels, a company might ask for an MBA as well as a track record in the technical skills. As well as the technical know-how, we are seeing more and more employers looking for people who have a commercial understanding of the industry – it is no longer good enough just to have a degree. For today’s jobs, chemists have to be able to link the science to the commercial world.

Are new PhDs expected to have business skills?

Not so much, but employers will be looking to see whether they spent a year working in industry while studying. This immediately makes someone more saleable. Also important is the ability to translate the science of your doctorate to other areas, plus the willingness to talk to marketing departments.

Can you get a job with just a BSc?

Yes, but the jobs will tend to be in quality control, assurance and production rather than in research.



“that solved a pressing industry issue – a world shortage of titanium dioxide”, he says. Being white, titanium dioxide is used to lighten other pigments to the desired shade. Unfortunately it is in short supply and extremely energy-intensive to produce.

Trapani’s team developed polymers that seek out titanium dioxide particles and bond to them, increasing the amount of surface which can be covered without increasing the amount of pigment. The end product is a paint that requires 20 per cent less titanium dioxide, making it greener and more affordable.

If the chemistry of paint fascinates you, don’t let a lack of expertise put you off. “Dow is not always interested in an expert in paint, but we are interested in creative scientists,” advises Trapani. “If you already have the skills of a rigorous scientist, then you should be able to put them to work in the paint industry.”

Chemists in the UK: How much could you earn?

AREA OF WORK	MEDIUM ANNUAL SALARY IN THE UK INDEPENDENT OF AGE AND GENDER	NUMBER OF REPLIES
Oil and allied products	£53,600	350
Pharmaceutical – research	£49,800	404
Pharmaceutical – manufacturing	£48,000	351
University and college of higher education	£47,600	358
Consulting firms	£45,000	144
Marker industry	£45,000	124
Plastics and polymers	£42,000	117
Water industry	£40,378	89
Central or local government laboratory	£39,500	104
Food and beverages	£39,300	78
Schools	£36,000	131
Research institute or association	£35,800	102
Contract research	£34,400	73

Andrew Watson, skincare chemist

Shopping for toiletries is not simple for Andrew Watson. A skincare scientist at Procter & Gamble (P&G), he invariably finds himself meandering over to the skincare aisle, just to check on “his” products. If the bottles are messy, he can’t help but tidy them up. It’s a matter of pride, he says with a laugh.

Watson has worked at P&G ever since graduating with a degree in chemistry from the University of Kingston, UK. He climbed the ladder and now leads a team of four scientists at the company’s lab in Egham, UK.

Watson is responsible for the formulation of cosmetic products such as facial moisturisers and body wash, primarily for the Olay brand. He also communicates with chemical

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suppliers and universities, keeping a lookout for innovations which could lead to research collaborations and new products.

There’s a major problem-solving element to Watson’s work. In designing a new product, he has to consider how consumers from different cultures will use it, what other products they might combine it with, how long its shelf life should be and what range of temperatures it might be stored at. He also has to figure out

how the product will behave on the skin, how dense or creamy it should be and how it will be applied (by pump or from a jar with the fingers, for example). He convenes consumer focus groups to glean these crucial insights.

One such insight is that Russian women often combine an Olay skin cream with sea buckthorn berries. Watson undertook a detailed analysis of sea buckthorn extract to see whether it had any chemical properties that would be useful in skincare products. “I want to put in something that gives them a ‘wow!’”, he says. That research led to a new anti-ageing skincare line that is already on the shelves in Russia and Europe.

For chemists who want to get into the world of cosmetics and skincare, Watson says flexibility and adaptability are key, as consumer trends change frequently. He recommends joining organisations such as the Society of Cosmetic Chemists and the Royal Society of Chemistry to keep abreast of industry developments.

For Watson, the best bit of his job comes with the realisation of all his team’s hard work. “This job is more than lab coats and solutions,” he says. “I consider it a great personal achievement when I see a product I’ve worked on on the shelf and selling really well.” n

Alaina G. Levine is a science writer based in Tucson, Arizona