CyanoGuard: Making Cyanide Visible

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About the company and its history

CyanoGuard AG is a young chemical technology company with ground-breaking technology for naked-eye detection of cyanide in water, food extracts and blood samples. A spinoff of the University of Zurich, the company was founded in 2016 to improve water and food safety, environmental monitoring and emergency healthcare globally. CyanoGuard's first commercial product, CyanoKit®, is a quick indicator of free cyanide that enables everyone to test aqueous samples in any setting, at any time. The company's core business is providing detection kits, but it also offers bespoke solutions' development and consulting services to clients in the chemical, food, and healthcare industries.

Scientific Innovation

CyanoKit® is based on an immobilised corrin-based chemosensor[1] that allows the colorimetric detection of endogenous cyanide in water and biological samples such as foodstuffs[2] and blood[3]. The mechanism of detection is based on a colour change, from orange to violet, of the chemosensor once its cobalt-centre binds to cyanide. The colour change is caused by the altered π-π* transitions of the corrin macrocycle (shown in Figure 1), which leads to a major bathochromic shift of its absorption maxima.

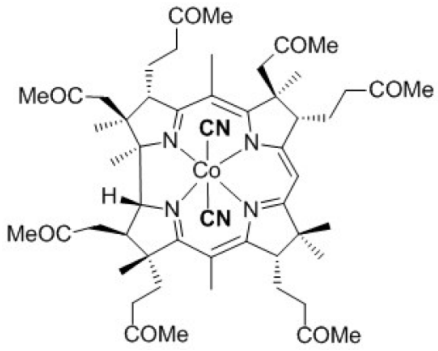

Figure 1: Structural formula of the corrin-based chemosensor

We have developed a new test tube technology where our indicator is immobilised on a hydrophobic material. In CyanoKit®, cyanide coordinates to the immobilised indicator and is thereby removed from the matrix. This allows the user to see the results immediately and without any type of analytical instrumentation.

Our developed method for free cyanide detection is fast, simple and eliminates the use of hazardous substances. CyanoKit® has already been adopted by players in our target industries and its performance has been validated using real samples from our clients. Our test kit suffers from the lowest number of interferences when compared to current market alternatives and is competitive in terms of accuracy, handling and speed of detection. Promising initial results for blood testing are expected to lead to the development of the first commercial quick test for cyanide in blood.

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[2] F.H. Zelder, L. Tivana, *Organic & Biomolecular Chemistry*, **2015**, *13*, 14-17.
[3] C. Männel-Croisé, F.H. Zelder, *Analytical Methods*, **2012**, *4*, 2632-2634.