

FeONIX CASE HISTORY



STAIN REMOVAL TECHNOLOGY 'LIFTS' COATINGS' COBALT LEGACY

The unlikely discovery that determined paint formulations of the future

The sciences are usually thought of as forward-thinking. And as this case history shows, 'out of the box thinking' is what it takes to deliver truly ground-breaking technologies. Here we take a look at what links tomatoes to paint drying additives and the "Eureka moment" that made possible one of the most important milestones in the coatings industry's recent history.

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THE CHALLENGE

Cobalt has been traditionally used in alkyd-resin based paint formulations to accelerate the curing process. But since it first came on the radar of the European chemical regulatory body as a substance of concern, the coatings market has been under pressure to find an alternative additive that can deliver a performance 'match' - in combination with other critical components - as well as offering a commercially viable solution.

THE CATALYST FOR CHANGE

In the scientific quest to rise to coatings' cobalt replacement challenge, the key moment came when researchers recognised that the chemistry of the radical autoxidation processes are the same for food-oil based stain bleaching and curing of alkyd resins – meaning potentially the same stain bleaching catalysts could work well for paint drying.

The team behind this observation is the same team leading specialist oxidation catalysis company, Catexel, today. As well as representing a turning point for coatings, it was the defining moment for the company now known as Catexel, as it was affirmation that its chemistry and IP could be highly valuable to areas outside of the detergents and cleaning space, for which its platforms had originally been developed.

Though important, making that connection between the chemical structures of stains and some types of paint, was just the start of a long and methodical journey, during which the catalytic behaviour of many hundreds of combinations of potentially problem-solving chemistry was explored.

THE SOLUTION

Of particular interest was an iron catalyst that didn't require the use of hydrogen peroxide and which showed exceptional stain removal performance. Radical-based auto-oxidation reactions were known to be responsible for its superior properties in laundry applications – particularly on oil-based stains, such as tomato cooking sauces.

But why are the mechanisms of tomato oil stain bleaching so similar to those of alkyd paint drying? After extensive testing of various model systems, Catexel's scientists determined that the radical chemistry of the hardening of alkyd resins is, in fact, very similar to the autoxidation chemistry leading to bleaching of lycopene - the red colour in tomatoes, and that, therefore, the same catalysts may be active for very dissimilar applications.

So, what started out as an expert observation was clearly evolving to be a much more interesting strategic proposition for a global market under growing regulatory pressure. Especially as the research and development team had secured the robust patent protection required to ensure any prospective licensees would inherit genuine competitive advantage.

The technology indeed proved attractive and OM Group, a major multinational coatings player, first secured the licence deal to leverage the proven paint drying capabilities of this catalyst, marketed as FeONIX.

THE OUTCOME

Consequently, the iron catalyst once destined for the washing machine is now used by manufacturers across the globe as a drier in alkyd paints. And the scope for the platform was such that the OM Group then went on to purchase the company that pioneered FeONIX and the IP rights to further develop the product for the inks, composites and coatings markets.

The R&D team that made the initial discovery remained free to explore its potential in other areas, however. Moving forwards as Catexel, the collective with a deep knowledge of oxidation catalysis and an excellent track record in value creation, continues to champion science that supports positive change in a variety of markets - but with a strong focus on the further potential its portfolio still holds for the coatings sector.

