

Business Skills and Commercial Awareness for Chemists

'Lemon Bleach' Scenario

Developed by the University of York and University of Warwick

This resource was produced as part of the National HE STEM Programme



'Lemon bleach' scenario

Your position as a chemist at a custom synthesis company has led you to prepare a number of nitriles whilst investigating routes to the related aliphatic carboxylic acids for a client (Figure 1). You are struck by the strong citrus and jasmine fragrance character of the molecules and find yourself reminded of the perceived difficulty of capturing citrus character in molecules that are stable to aggressive chemical conditions. The 'holy grail', as you recall it, is for fragrance chemists to be able to impart a genuine lemon character to a cleaning product as aggressive as household bleach.

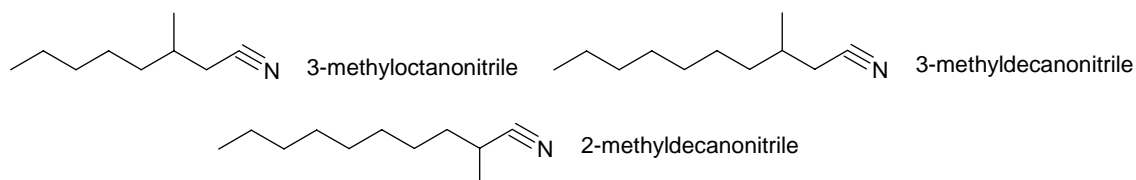


Figure 1 Fragrant nitriles

You prepare samples of each nitrile in 10% sodium hypochlorite solution and monitor the fragrance over several weeks. The results are encouraging, suggesting that by avoiding the double bonds and aldehyde group, you have prepared stable analogues of citral, one of the key fresh, but labile, components of natural lemon (Figure 2).

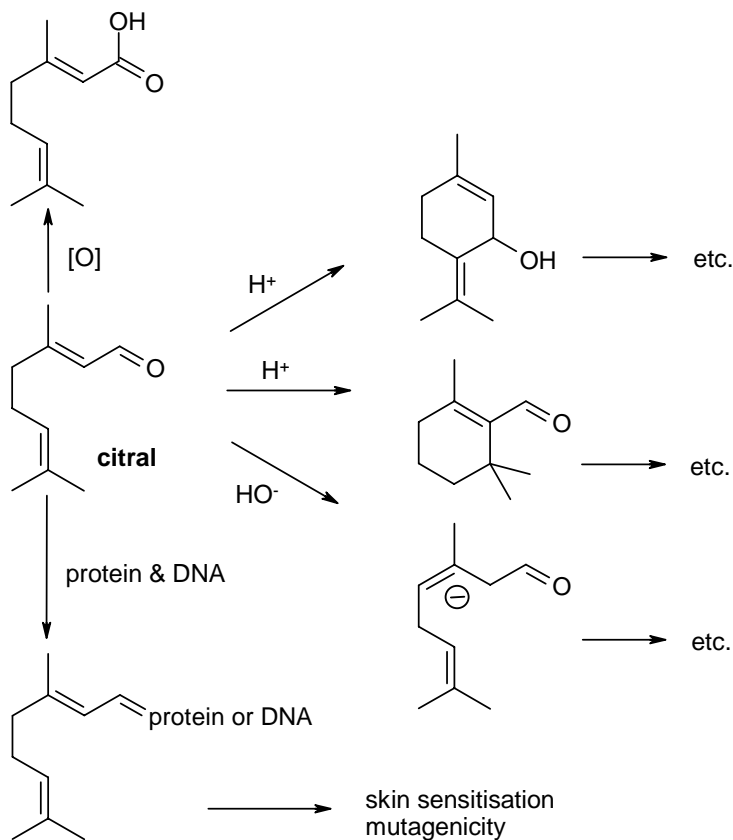


Figure 2 Instability of citral in chemical cleaning product media

You are sufficiently encouraged to seek the advice of industry perfumers who are able to confirm that, when blended with other known (stable) fragrance components, all three nitriles offer unique and distinctive notes somewhere between lemon citrus and jasmine. However, they are unable to guarantee from these blends alone that the nitriles are novel to the industry.

You conclude that from a perfumery point of view there is the potential to build a business on the back of a new 'lemon bleach' product line. In particular, you wish to exploit the association of citrus aroma with cleanliness and the chemical robustness of the nitrile fragrance component in a distinctive new household bleach product line, with the potential to expand into hard surface cleaners, lavatory cleaners and 'creme' cleaners. You are aware of other possible factors that may help build a niche brand, such as the environmental credentials of the cleaning products that will incorporate the fragrance.

Imagine that you have chosen a 'vertically integrated' operation where instead of trying to convince an existing cleaning product manufacturer to adopt your distinctive new fragrance, you are planning to sell the fragranced cleaning product range under your own name. You will buy in the base cleaning products themselves (and the other fragrance components) but your new company will produce the novel nitrile fragrance component/s at your own site. Your site must also handle the blending and dosing of fragrance into bulk, bought-in unfragranced, base cleaning product/s (bleach etc.), as well as subsequent packaging and distribution.

Task

Your task is to produce a business plan with a view to raising capital to start a new business supplying your own brand of distinctively fragranced 'lemon bleach' and any other related product lines you choose. Remember, your idea is to produce the novel nitrile component/s in-house and to have the facilities to process and package the unfragranced bleach (and possibly other products) into your marketable product/s. You should consider:

- the IP landscape: are you free to produce and use these nitriles as perfume components? How will you protect your ideas?
- regulation: what regulations need to be met in the production of chemicals for use in household products in order to protect your workforce and the consumers?
- quality: what quality measures need to be met to validate production of this type of product?
- marketing: how will you establish brand identity in order to penetrate a well-established market?
- money: how much will it cost to produce the fragrance component based on the chemistry you are using? Can you use accounting models to predict the overall consequences of acquiring appropriate site, plant and workforce in addition to consumable/operating costs for chemicals and product bases?

Your recommendations should be presented in the form of a business plan, including a ca. 150 word executive summary.

Assessment

If your report is to be assessed as part of your coursework, please consult your tutors for the assessment criteria.

Supporting information

This scenario links closely to individual tasks that are found in the 'Ideas', 'Regulations', 'Quality', 'Marketing' and 'Money' business topics. The individual tasks found there should equip you to take on the wider challenge of producing the business plan described above. In

'Money', for instance, you will have met approaches to help you think about costing the production of a chemical, such as the fragrance components here, but you will have to use other sources and make estimates if you wish to present a full cost analysis of the proposed operation. This would have to reflect an appropriate site and plant (to produce the fragrance component/s, to formulate the raw materials into fragranced products, and to package for distribution), staff, raw materials (unfragranced base cleaning products or the ingredients from which to formulate them, other fragrance components), packaging supplies (bottles etc.), analysis and testing etc.