

# 5<sup>th</sup> Global Chemistry Congress

September 04-06, 2017 | London, UK

## Aulana®: Novel Nanogold Coloured Wool Textiles for Luxury Markets

James H Johnston and Thomas Borrmann  
Victoria University of Wellington, New Zealand

Aulana® is a new technology and luxury nanogold-wool textile product suite, which innovatively combines the nanoscience of gold with wool fibre proteins to produce a boutique colour range of nanogold-wool textiles for high value international luxury markets. Aulana® captures the exciting and unique opportunity whereby the prestige and high value of gold are linked directly to the high quality of New Zealand wool through the use of nanogold as novel stable colourfast colourants in the wool, for the international high quality fashion apparel, luxury textiles, carpet and rug markets<sup>1-3</sup>. This utilises the localised surface plasmon resonance properties of nanogold wherein the colour exhibited by the gold is dependent upon the size and shape of the nanogold particles and the dielectric constant of the surrounding material<sup>3,4</sup>. These particles are chemically bound to the sulfur and nitrogen containing amino acids in the wool fibre proteins on the cuticle surfaces and edges (Fig. 2). Spherical particles of gold about 10-20 nm are pink-red in colour<sup>3-5</sup>. Precise control of the particle size enables the colour to be changed progressively through shades of pink, red, purple, blue-grey to grey (Fig 3.) Gold nanorods potentially offer shades of blue, green and red colours, depending upon the aspect ratio of the gold nanorods<sup>6</sup>. Nanogold colourants cannot fade or denature in sunlight and hence the nanogold coloured wool products exhibit excellent lightfastness. Electronmicroscopy and associated X-ray elemental mapping and X-ray photoelectron spectroscopy show the nanogold is primarily bound to N and S entities on the cuticle edges. The proprietary Aulana® technology and product suite has been developed on the laboratory scale and progressed to pilot and commercial scale production for loose wool, combed top wool, yarn (Fig. 3) and fabric as required, using stainless steel textile dyeing equipment. Noble Bond Ltd which owns the Aulana® brand, is commercialising Aulana® products for use in luxury apparel, upholstery textiles, rugs and carpets. This utilises Noble Bond's network of businesses concerned with the wool industry and high value wool products.



### Biography

James H Johnston has a Personal Chair in Chemistry at Victoria University of Wellington. He is a Principal Investigator at New Zealand Product Accelerator. He works at university-industry interface where he is recognized nationally and internationally for his research contributions and achievements in materials science, nanotechnology and new chemical technologies and product developments. This has led to the establishment of three new start-up companies to facilitate commercialization of his and co-workers research. He is a Fellow of the Royal Society of New Zealand and of the New Zealand Institute of Chemistry.

jim.johnston@vuw.ac.nz

### Notes: