

Integration of cosmetics with textiles: an emerging area of functional textiles – a review

Abstract

Cosmetotextiles has promising, fast emerging market for both the cosmetics industry and the textile industry. There are different types of Cosmetotextiles which are classified on the basis of end use, ingredients used and fabric used. A wide range of agents used in Cosmetotextiles are aromas and perfumes, slimming agents, moisturising agents, anticellulite agents, sunlight absorption agents and antioxidants agents. Cosmetotextiles are fashioned by grafting, microencapsulation, coating technique, doping and by incorporating different substances for health or body care that are steadily transferred to the skin by movement, pressure or the effect of the skin's natural warmth. There are various synthetic and natural materials which are used in Cosmetotextiles such as fruit extract, like essential oils, plant extracts, flower extracts, and animal extracts as natural sources along with some synthetic substances including zinc oxide, iron oxide, ethane diol and zinc nanoparticles and many others. The pioneering development of Cosmetotextiles can be as wide as thoughts & imagination. It is projected that the development of Cosmetotextiles will continue to grow and discover completely new possibilities for providing various body care functions to the wearer in the near future.

Keywords: cosmetotextiles, wellness, microencapsulation, cosmetic ingredients

Volume 4 Issue 4 - 2018

Kanjana S, Nalankilli G

Ethiopian Institute of Textile and Fashion Technology, Bahir Dar University, Ethiopia

Correspondence: Nalankilli G, Ethiopian Institute of Textile and Fashion Technology, Bahir Dar University, Bahir Dar, Ethiopia, Tel +251 984624403, Email gnalankilli@yahoo.com

Received: March 13, 2018 | **Published:** August 29, 2018

Introduction

Textiles which provide cosmetic and life functions, such as energising, slimming, body care, fitness, refreshing, vitalising, pleasant feeling, skin glowing, anti-ageing, and health, are categorised as cosmetotextiles.¹ The wellness or health encouraging aspects of textile finishes have become a enjoyable functional matter in the 21st century. Wellness can be described as a pleasant state free from disease, a healthy balance between the human mind and body. Wellness has become a societal determination which symbolizes the wish for everlasting youth against getting old. The extracts of natural products and selected essential oils are added to textiles, which not only have healing and remedial properties but also keep the wearer fresh and energetic.

Classification of cosmetotextiles

In terms of their control on the human body, cosmetotextiles can be categorized as cosmetotextiles for slimming, moisturizing, refreshing and relaxing, energizing, perfuming, vitalizing, UV protection, improving the firmness and elasticity of skin.

Ingredients used in cosmeto-textiles

Some of the synthetic and inorganic compounds are Zinc oxide, Zn particles, bireactive oxalic acid, Iron oxide, Titanium oxide, and Copper oxide & their benefits in this field are observed as protection against UV radiations, Antimicrobial activity in textiles.^{2,3}

Animal derivatives

Chitosan, Squalene and Sericin are some of the animal derivatives obtained from the exoskeleton of shrimps or Shark liver, crabs, Degumming liquor of silk cocoons and their benefits such as Antibacterial, wound healing, deodorant effect, nourishes and even out moisture level, kindles cell regeneration.⁴ Natural antioxidant, protect the skin against photo aging and from brown age spots⁵ moisturizing agent, anti-ageing, and anti- wrinkling effects.⁶

Plant derivatives

Aloe vera, Padina Pouvonica, Flowers, Fruits, Oils are classified as Plant Derivatives and these are derived from Leaves of Aloe Vera plant, Brown algae, wheat germ oil, Innone (Violet), cedaroil (lilac), hydroxycitronellol (lily), alpha hexyleinnamaldehyde (jasmine), Citral (lemon scent), Allylcaproate (rosescent), Anillin (apple scent), Cinnamaldehyde (pineapple), Prenyl acetate (banana), Heliotrotil (cherry), Peppermint, Lavender, Thyme, Sage, Eucalyptus and Camomile oil respectively & their benefits such as Antibacterial, Antiviral, Antimycotic nature, Wound healing and anti-inflammatory effects,⁷ maintains elasticity and firmness of the skin, Antioxidant and moisture binding capacity,⁸ Aroma for relaxation and refreshment to the wearer⁹ Deodorant effect on textiles provides stimulant and relaxation to the wearer,¹⁰ and other wellness effect.¹¹

Global market for cosmetotextiles

Some of the Selected Cosmetotextiles with manufacturer's product names such as Ajinomoto with Mizuno Corp USA with brand name "Amino Veil",¹² Yonex: Sports cloth manufacturer,¹³ Fuji Spinning, Japan with Brand Name V-Up,¹⁴ Invista (previously DuPont Textiles & Interiors) with International Flavors & Fragrances (IFF), Richa (BE) Collection, 2007 phase-change materials (PCM), Cognis Oleochemicals Corp. with brand name "Skintex",¹⁵ Dogi International Fabrics aloe vera, LYOSILK® Hefel Textil GmbH¹⁶ Austria, SEACELL®ACTIVE Hefel Textil GmbH, Austria, Solidea, Italy MicroMassage Magic, Cosmetil & Variance, Hydrabra and many more.

Apart from the novelty in the fiber and fabric, many textile manufacturing companies tending towards the development of finishes providing cosmetic effect to the users. A wide range of finishes have been commenced by various cosmetotextiles manufacturers, like Skinsoft 415 New, Parafine SC-1000, Parafine SC-500, EVOTM CARE VITA.¹⁷ Cosmetic finishes have been applied on several kinds of textiles, from clothes as a second skin, to interior textiles such as carpets, curtains, and sheets. A variety of fabrics with different

structure were used by scientists and scholar in recent years for storage and control release of active component and antioxidants (monochlorotriazinyl beta-cyclodextrin, gallic acid) using coating and microencapsulation method in order to widen the reach and application of cosmetotextiles.¹⁸

Legends & Heroes under the brand name Ript Skinz, Wrangler launched a line called “Denim Spa Therapy for Legs.” Mizuno Corp. and Ajinomoto Co. have jointly introduced “Amino Veil”, Wow Amino Jeans was launched by Tejin Co. Ltd, Japan, Clariant and Lipotech developed a new expertise called Quiospheres®.¹⁹

Developing cosmetotextiles using the microencapsulation method

Various cosmetic constituents are prone to heat or prone to oxidation, whereas deodorants are volatile. These are the major driving forces to adopt microencapsulation as the chief technique to build up cosmetotextiles. Microencapsulation can prolong the shelf life of various volatile and nonvolatile cosmetic ingredients by delaying oxidation and evaporation, respectively.

Cosmeto fibres

One of the producing process of a cosmetotextile is based on fictionalization of fibers by fixing microcapsules in their structure: NOVOREL nylon microfiber (patented in 2006 by Nurel), incorporates the microcapsules into the polymer of their nylon yarn, before extrusion; - TENCEL C, from Lenzing, have microcapsules of chitosan, - NILIT BREEZE – a new fiber from Nilit, that from side to side a amalgamation of a flat cross-section structure, a unique polymer with inorganic micron particles, and a special texturizing process, make sure the lower of body temperature, EMANA, a bioactive yarn from Rhodia, is created by the mixture of polyamide 6.6 and a polymer with added bioactive crystals of bio ceramic. These crystals are built into the DNA of the fiber itself. The fibers reflect the far infrared rays released by the body back into the skin, helping to normalise the body's temperature, reducing the accumulation of lactic acid, and humanizing skin tone.

Cosmeto fabrics and products

One more method to produce cosmetotextiles is the functionalisation of fabrics, so of products made by these fabrics. In this scheme, microcapsules are fixed on the exterior surface of the fabric, ensuing in revolutionary “fabrics’ treatments” for beauty, health-care and comfort *Eurojersey* (an Italian warp knitter) created *Sensitive Ultra Light Firming* fabric, which comprises ‘firming lively constituents’ that pick up the elasticity and brilliance of the skin. *Sensitive Fabric Bodyware*, that offers a treatments program for most favorable hygiene and better management of perspiration. To keep the wearer feeling unsullied and fresh all day long increasing comfort in all environments, the fabric includes a silver based solution that inhibits the growth of odor-causing bacteria helping your clothes to stay fresher, more at ease and in better state for much longer. Furthermore, due to an novel polymer applied on this fabric, it alters properties in reply to body's temperature, at low temperature it arrests moisture, keeping the body drier and warmer, as temperature increases and it cools the body.

Methods of application over textiles

There are essentially different ways of applying cosmetic effects on textiles; Microencapsulation, coating, dope insertion.

“Microencapsulation is a micro packaging technique that involves the production of microcapsules which act as barrier walls of solids or liquids”. These capsules are produced by deposition of a thin polymer coating on dispersions of solids in liquids. The core ingredients in these capsules gradually transfer to the skin by the movement, pressure, skin natural warmth and the enzymes thus these cosmetic textiles nurture and renew the skin when worn next to skin.²⁰

Conclusion

Various discovered and unexplored natural materials may find marketable importance via cosmetotextiles. The enlargement of cosmetotextiles will be continued to develop and explore totally new possible outcomes for passing on various body and wellness functions to the wearer. It really gives the compensation to the consumers for a precise time period. Scheming Cosmetotextiles has to be done in such a way so that the building and work of art of textiles, garment design and cosmetic finish must all work jointly to display most favorable cosmetic effects

Acknowledgements

None.

Conflict of interest

Authors declare there is no conflict of interest in publishing the article.

References

1. Umweltbundesamt. Use of Nanomaterials in Textiles. 2013.
2. Ibrahim NA, Refaie R, Ahamed AF. Novel approach for attaining cotton fabric with multi functional properties. *Journal of Industrial Textiles*. 2010;40(1):65–83.
3. Borkow G. Using Copper to Improve the Well-Being of the Skin. *Curr Chem Biol*. 2014;8(2):89–102.
4. Gardetti MA, Muthu SS. (2015) Handbook of Sustainable Luxury Textiles and Fashion. Singapore: Springer; 2016. 161 p.
5. Main functions of Cosmetotextiles. 2014.
6. Rajput SK, Singh KM. Sericin- A Unique Biomaterial. *IOSR Journal of Polymer and Textile Engineering*. 2015;2(3):29–35.
7. Vanaverbeck S. Cosmetotextiles: Beauty from Within. 2014.
8. Robinson H. The best anti-aging ingredients you need to know about. 2015.
9. Sun G. Antimicrobial Textiles. Cambridge: Woodhead publications; 2016: 1–3.
10. Minocheherhomji FP, Solanki B. Ayurveda: An innovative alliance of Ayurveda and Textile: A review. *Scholars Journal of applied Medical Sciences*. 2015;3(2F):925–31.
11. Muthu SS. Roadmap to Sustainable Textiles and Clothing. Textile Science and Clothing Technology; 2014. 287 p.
12. Holme I. Innovative Technologies for high performance textiles. *Coloration Technology*. 2007;123(2):59–73.
13. World leader in Golf, Tennis and Badminton.
14. Japan in European: Fuji Spinning Co. Ltd. Patent EP 1251202.
15. Hema U, Shahnaz J, Monika U. Cosmetotextiles: Emerging Trend in Technical Textiles. *IOSR Journal of Polymer and Textile Engineering*. 2016;3(6):8–14.

16. Dogi International Fabrics.
17. Anonymous Germany. Evo Care Vital wellness finishes for textiles by Dystar. 2005.
18. West DP, Zju YP. Evaluation of Aloe Vera gel gloves in the treatment of dry skin associated with occupational exposure. *Am J Infection Cont.* 2003;31(1):40–2.
19. Mukesh KS, Varun VK, Behera BK. Cosmetotextiles: State of Art. *Fibres & Textiles in Eastern Europe*. 2011;19(87):27–33.
20. Srinivasan B. Introduction to Cosmetic Textiles and Micro Encapsulation Technology. 2011.