Feature; Spa and bathroom products 2014
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Spa treatments were once the exclusive domain of so-called health farms set in impressive manor houses in the countryside, where diet, exercise and beauty treatments were all part of the experience. These still exist but there has been an explosion in alternative venues, which now include the majority of the larger hotels, most health clubs and many beauty salons. A quick survey of the treatments offered by these establishments shows that massage, facial cleansing, body exfoliation and manicures and pedicures still top the list. The larger establishments also include a swimming pool, Jacuzzi, steam room and sauna and keywords are pampering, natural and detox. Ear candles, Indian head massage, foot baths containing skin-eating fish or where an electrical current supposedly drains away all the toxins in the body out through the feet may also be offered but are outside the scope of this feature.

The first step with the majority of treatments is a pampering shower. Keywords are mild and moisturising plus sulphate-free and PEG-free and the majority of suitable surfactants described here are also ideal for facial washes and other personal cleansing products.

Ajinomoto suggests Amilite ET-CS-12 [INCI: Sodium cocoyl glutamate, disodium cocoyl glutamate, sodium cocoyl threoninate], which is described as an ultra-mild anionic surfactant that leaves a pleasant moisturised skin feel and it improves both foam volume and quality of sulphate-free systems. **Ajinomoto** recommend that it is used at 10% with 10% Amisoft CS-22 [NCI: Sodium cocoyl glutamate, disodium cocoyl glutamate] for a cleansing system that is safe for use on all mucous membranes, making it ideal for intimate, baby, oral, and leave-on cleansers and eye area applications.

Sucrose esters impart a pleasant skin feel and **Sisterna** proposes Sisterna L70-C, an aqueous-alcoholic solution of sucrose laurate as an additive for personal cleansing products with a skin conditioning effect. It is also effective as a PEG-free perfume solubiliser. An interesting suggestion from **Sisterna** is self-tanning foam comprising 4% dihydroxyacetone with 5% Sisterna LC70-C and 3% glycerin, stabilised to acid pH and suitably preserved. Another suggestion is for a gel-to-milk cleanser comprising 7.5% Sisterna L70-C and 3% Sisterna PS750-C [Sucrose palmitate] with 14% glycerin, 60% caprylic/capric triglycerides and 14% Simmondsia chinensis (Jojoba) oil. It is described as an anhydrous oil in glycerine formulation, which turns into a milky emulsion upon contact with water and leaves a pleasant moisturised feeling on the skin. This has many novel application areas such as make-up removal and sugar scrubs as there is no water to dissolve the sugar.

Keeping to surfactants based on natural resources Beautycare Amphoteric surfactants from **B.C. Cosmetics and Food** are directly derived from the triglycerides of oils and butters, which maintain the claims and emollient characteristics of the source materials. These include oils of argan, babussa, cocoa butter, cottonseed and shea and many others. They are stable over a wide pH range and are particularly recommended for very delicate skin. B.C. also supply acyl glutamates and sarcosinates based on amino-acid chemistry. The amino-acid grouping ensures substantivity to protein surfaces, forming an epidermal barrier that retards moisture loss.

Lipex Shea Betaine from **AAK** is an amphoteric primary surfactant based on Shea butter with foam boosting and viscosity building properties. The shea butter and shea butter unsaponifiables contribute to its mildness and irritation reducing properties. It is said to give higher viscosity and more creamy texture to the formulation when compared to a typical coconut based betaine and being substantive to skin, it imparts a nice skin feel. MG-60 from **Hayashibara International** is a solution of maltooligosyl glucoside and hydrogenated starch hydrolysate described as a multi-functional carbohydrate syrup derived from starch. It may be added to cleansing washes to improve foam richness and bubble retention and to significantly reduce irritancy.

Seppic has a number of mild surfactants: Proteol APL [INCI: Sodium cocoyl apple amino acids] is a 30% active anionic surfactant that gives a light and creamy foam that remains stable over an extended period. Proteol Oat PF [INCI: Sodium lauroyl oat amino acids] is also a 30% active anionic surfactant that gives a stable creamy foam and it does not remove skin lipids or affect trans-dermal moisture loss (TEWL) Oramix CG110 [INCI: Caprylyl/capryl glucoside] is demonstrated to be effective at solubilising essential oils and perfumes. Oramix NS10 [INCI: Decyl glucoside] is said to be an excellent cleanser, to improve the foam and mildness of other surfactants and to respond well to thickening additives.

Increasing viscosity of surfactant products based on non-ethoxylates can be a difficult. Ecogel from **Lucas Meyer** is claimed to be a natural solution to the problem and it also adds a silicone-like skin feel to the product. It is described as an optimised combination of ingredients of natural origin: lysophospholipids, xanthan gum, sclerotium gum and pullulan. Its thickening properties are due to the synergistic polysaccharide combination of xanthan gum and sclerotium gum. It is stable over a wide pH range and is little affected by electrolytes. It also acts as an emulsifying agent and can be used to prepare gel-creams.

Kalichem Italia supplies Olivoil Avenate, which combines the perceived goodness of olive oil and oats to give the INCI name potassium olivoyl hydrolysed oat protein. According to **Kalichem**, oat is the only cereal containing a globulin or legume-like protein, avenalin, as the major storage protein. Globulins are characterised by their water solubility and because of this oat flour may be turned into milk but not into bread. The minor protein of oat is a prolamine called avenin and the combined protein content of oat husks is 12 – 24%, the highest protein content of all cereals.

The hydrolyzed protein fraction contains about 3% beta-glucan, which is thought to have skin healing properties, to stimulate collagen synthesis and promote cellular turnover. The hydrolysed oat protein supplies the hydrophilic head of the surfactant whilst olive oil is the source of the hydrophobic tail. Olivoil Avenate may be used as the primary surfactant for very mild cleansing cosmetics and because of its hydrolysed protein fraction and beta-glucan content, it may act as functional ingredient, providing skin benefits such as moisturising and emollient, soothing and protective effects.

Crodarom has combined the saponins from three plants to create Phytofoam, a surfactant said to provide dense creamy foam when used for facial cleansing to remove make-up and impurities associated with pollution. It may also be used as a

secondary surfactant for body washes to impart a pleasant sensorial experience. It is a combination of Shikakai, originating from India and reputed to be a very mild skin and hair cleanser according to the Ayurvedic tradition; Desert Date, a tree grown in tropical Africa, used traditionally for treating skin problems, and Gypsophila, also known as “soap plant”, which contains a high quantity of saponins that has been used as soap in the Mediterranean Basin for centuries. Its INCI listing is aqua, acacia concinna fruit extract, Balanites aegyptiaca fruit extract and Gypsophila paniculata root extract.

Taking advantage of the current fad for “Free from” **Innospec Performance Chemicals** has produced a PowerPoint presentation advocating “Sulfate free”. It shows that even the well-established brands have sulphate-free products and that their growing popularity is based more on consumer perception than science. However, it is consumers that buy the products and they perceive them as being environmentally friendly, milder to skin and hair and to improve colour retention on treated hair. The presentation discusses the challenges of formulation as the surfactants are generally more expensive and show performance deficiencies in respect of foaming and cleansing efficacy compared to sulphates.

Useful charts showing almost all possible alternatives with comments regarding performance and suggestions about thickening with suitable rheology modifiers are included in the presentation. Of particular interest for body washes **Innospec** proposes Iselux [INCI: Sodium lauroyl methyl isethionate] as a mild surfactant for body washes and other personal cleansing products. **Innospec** also supplies a ready mixed surfactant blend called Iselux SFS that is sulphate-free and optimised so it that only needs the addition of water to make hair and skin cleansing products.

If ethoxylates are not banned by the product brief then **Lipo Chemicals Inc**. suggests Liposorb L-80 [INCI: PEG-80 sorbitan laurate] as a solubiliser and a secondary surfactant for mild cleansing washes. Liponate SB-50 [INCI: PEG-50 shea butter] for body washes with a refatting action and Lipocol ME-6 [INCI: PEG-6 methyl ether] to add emolliancy to facial cleansers. Amidet N [INCI: PEG-4 rapeseedamide] is a non-ionic surfactant from **Kao Chemicals,** which has very similar properties to those of cocamide DEA in terms of its viscosity boost, foam production and solubilisation of oils and fragrances and in body wash surfactant systems.

Also from **Kao**, Emanon EV-E [INCI: Glycereth-7 caprylate/caprate] is targeted at providing shower creams with rich foaming and skin conditioning properties by deposition of oil. If silicones are permitted **Belsil** OW1500 is a copolymer of polydimethylsiloxane and an organic glycol that adds foam stability and skin feel when added as a secondary surfactant to shower gels.

Surfactants based on olive oil are in vogue: Olivem 460 from **B&T (Hallstar)** is a 60% active mild anionic surfactant of sodium PEG-7 olive oil carboxylate derived from olive oil fatty acids with foaming, cleansing and solubilising properties. Beautyolea S4 from B.C. is also sodium PEG-7 olive oil carboxylate and Beautyolea S3 is olive oil PEG-esters.

Dow Corning HMW 2220 Non-Ionic Emulsion is a divinyldimethicone/dimethicone copolymer emulsified with alkoxylated alcohols as a unique way of incorporating a

high viscosity polymer into water-based systems. This product can be used in skin care and body wash applications including skin creams, facial cleansers and shower gels. It imparts a rich feel to skin care products in addition to wash off resistance and in is claimed to provide superior foam and good skin feel to body washes.

All things natural are favoured in Spas and this extends to the preservative system and product colouring. Alternative preservatives were described in SPC ???. To add to the information in that article a very useful brochure has been published by **Schulke and Meyer** that details its extensive range of preservatives. It summarises their legal limits in the EU, ASEAN and USA and the pH and temperature ranges at which they remain stable and effective.

For natural colours **Lessonia's** MicroZest is a range of twenty-five plant powders that can be used for colouring shower gels and other surfactant products. The range includes Carrot Orange, Carrot Pink, Monacolin Red and Gardenia Blue and they are described as vibrant and stable. Many are Ecocert approved and as well as finding application in surfactant-based products they can be readily dispersed in pressed or loose powders, oil-based products, lipsticks, balms and emulsions.

The principal action expected from a shower gel or body wash is obviously cleansing but consumers expect products to be multifunctional so a variety of additives to confer additional benefits are available. If these are to be more than a miniscule of herbal extract to decorate the label they have to overcome the problem of being washed away before they can be of benefit. **Soliance** claims to have overcome this problem with spherulites technology.

Spherulites are microspheres made from multiple double layers of surfactants that are structured like an onion. Depending on their size, Spherulites can contain between 50 and several hundred membranes made using a wide range of anionic, cationic and non-ionic surfactants. Their sizes vary but these vesicles are measured in microns and they are not nanoparticles and so do not have to be labelled as nanoparticles under the EU Cosmetics Regulation of 2009.

Spherulites remain stable in personal body wash products and can encapsulate a wide range of actives. Hydrophilic molecules reside in the inner layers of water whereas lipophilic actives stay embedded inside the aliphatic tails of the double layers of surfactants. Many of the more commonly used cosmetic actives are now commercially available in Spherulites from **Soliance** including alpha hydroxy acids, salicylic cid, sodium hyaluronate, antioxidants, and specialised membrane lipids such as ceramides, as well as anti-inflammatory actives and vitamins. When Spherulites are made with anionic or non-ionic surfactants, stripping experiments and fluorescent microscopy have shown that there is a deep progressive release into the upper layers of skin.

Spa products for home use are popular and any of the foregoing body and facial wash ideas would equally suit the professional establishment or the bathroom at home. Baths may be used more at home because of the space that they occupy and the length of time that the bather may wish to spend in it. Bath additives are generally designed to add lipids to the skin. For example Cleomilk from **Rhan** is Sesamum indicum (sesame) seed oil, Nigella sativa seed oil, Helianthus annuus seed oil and glyceryl

caprylate emulsified with sucrose stearate that gives a milky appearance when added to the bath. It also contains Aloe barbadensis leaf juice powder and xanthan gum and can be added to body washes or applied in leave-on o/w emulsion products.

Blooming bath oils have long been popular as they coat the skin with a smooth protective film of oil. A mixture of 25% Liponate OP-26 [INCI: PPG-26 oleate] from **Lipo Chemicals** with Laureth-4 and natural oils will give a blooming effect on addition to the bath. A similar effect can be obtained using PEG-40 sorbitan peroleate with PPG-15 stearyl ether from **A&E Connock**.

IRA Thermal Oligoelements is a mixture of the soluble salts of calcium, ferric iron, manganese, magnesium, copper and zinc that is said to replenish the skin with trace elements. A different approach to providing trace minerals is Algoserum with Guerande seawaters from **Agrimer Algues Marines**. It is supplied as a body gel based on a concentrate of seawater, rich in minerals and trace elements. Agrimer provides a number of products ready to be used in Spa treatments based on seaweeds and sea water and also mud packs and masks based on plants of the Amazon. **Beauté Sante** also supplies fully formulated masks and treatment products for use in spas, including and exothermic mask that reaches 37°C and powder and peel-off masks are available from **Tech Nature** in many different variations.

Exfoliation to remove dead skin cells is a principal treatment in all spas and exfoliating agents are added to shower gels, facial cleansers, body scrubs and foot scrubs. For shower gels the additive needs to be suspended so ideally it will have the same specific gravity as the gel itself. This is difficult to accomplish so suspending agents like xanthan gum, carbomers and acrylate copolymers are required. Systems that work well with ethoxylated systems may not do so with the milder surfactants discussed here and suppliers of the surfactants may be asked for help in solving the problem. Some years ago **A&E Connock** undertook a series of experiments to look into ways of suspending exfoliants and particulates and the methodology and results are available on its web site [Ref 1, 2].

With growing concerns about synthetic polymers used in cosmetics adding to sea pollution their use is in decline in favour of natural alternatives. Fortunately the variety of natural exfoliants available across the industry is almost unlimited; **A&E Connock** lists 74 from natural sources, ranging from micronised amethyst powder through ground seeds and nut shells, seaweeds and cereals to Hawaiian sea salt. This is described as an extremely pure sea salt taken from 2000 feet below the surface of the Pacific Ocean. At this depth the sea temperature is 6°C and it believed that the water has travelled slowly from the Antarctic taking 1000 years or more, ensuring that it is free of modern pollutants. Its mineral composition is different to that of surface water, being higher in potassium and magnesium and lower in sodium. It is drawn to the surface through a giant pump and then allowed to evaporate in protected tanks, leaving pure white crystals of fine Hawaiian deep ocean sea salt.

Travelling across the Pacific Ocean from Hawaii to Tahiti we find Black Pearl Powder [INCI: Pinctada margaritifera], which is ground oyster shell; Sandalwood powder [Santalum austrocaledonicum] from the heart of Pacific Sandalwood with exfoliating, colouring and covering properties, and Coral Powder. All three materials

are from **Pacifique Sud Ingredients;** the coral powder is loose coral deposited by ocean currents that is collected, dried, micronised and sieved to obtain different particles sizes.

Other interesting materials from **Pacifique Sud** include coral sands from different Pacific islands, each with its own unique colour; ground vanilla seed pods with a wonderful aroma and exceptional exfoliating properties and Tamanu Exfoliating Powder [INCI: Calophyllum inophyllum shell powder] from the tamanu tree to be found throughout Polynesia.

Massage is an essential part of most spa experiences and vegetable oils are the natural choice. One supplier to the trade in the USA lists 72 different oils and blends. For those wishing to avoid the traditional sweet almond and grape seed oils **Gemro** has produced a chart of 20 Amazonian oils with their principal properties. It is designed for those who wish to make soaps so includes their saponification values and effect in soap. For further differentiation essential oils are added and this requires the advice of a qualified aromatherapist.

Natural oils tend to be too labile for a long lasting massage: a material from **Amedeo Brasca** called Olifeel Pearls is a mixture of C16 and C18 triglycerides from olive oil that thickens oils and improves their skin feel. Olifeel TD 7525 is olive glycerides, which can also be used to improve massage oils and formulate massage balms. As well as the traditional “hands on” treatment clients may undergo hot stone massage with heated basalt pebbles or with the more exotic semi-precious stones that are endowed with mystical properties!

Hair removal is outside the scope of this article so after exfoliation and massage the next stage may be the use of a face mask or all-over body wrap. The various types of mask available are almost as diverse as the different massage products but fall into three main categories; non-drying, drying and peel-off. They may be used to draw impurities from the epidermis; to provide skin benefit agents; to have an immediate but transitional tightening effect or to be part of a slimming treatment. Keywords are natural, hydrating, soothing, anti-aging and wrinkle reduction.

Moisturising masks are specifically for the face and are non-drying. Particularly suitable are gel-creams and there are many hydrating actives that may be added. Avocadin HU25 from **Crodarom** is described as a multifunctional skin care ingredient that reduces discomfort, redness and dehydration and preserves skin youthfulness. Avocadin HU25 [INCI: Persea gratissima (avocado) oil, phytosterols, Olea europaea (olive) fruit oil] is described as a plant-based butter, rich in essential fatty acids, vitamins and phytosterols. Its thick and melting consistency and its high cutaneous affinity make it easily absorbed by the skin.

Collagen was a long-time favourite in anti-ageing creams but lost its popularity with the move away from animal products. Since then marine and vegetable versions have become available; whether they can be termed true collagen is not going to be argued here. Collasurge [INCI: Collagen amino acids] from **Croda** is of marine origin. It has a natural water-binding capacity and is substantive to skin. Also from **Croda** is Keratoline based on Bacillus ferment for enzymatic peeling.

For a film-forming mask **Grain Processing Corporation** recommends Zeina [INCI: Hydroxypropyl starch phosphate]. It is a water-soluble polymer designed to combine film-forming properties with a smooth, silky skin feel. The polymer has very low viscosity and is ideal for formulations requiring water-soluble film properties such as personal wash products and facial masks. The films can carry active ingredients, oils, or other raw materials.

A nice additive with strong appeal to Spa clients might be NanoCacao from **Mibelle Biochemistry**. It is a lipophilic fraction of cocoa beans encapsulated in a nano-emulsion. Cocoa beans contain anandamide, a lipophilic substance which is also naturally produced in our brain. This neurotransmitter induces euphoria, regulates appetite and relaxes muscles. Anandamide binds to the cannabinoid receptors which are also present on certain skin cells and experiment shows that it can relax muscle contractions and improve the smoothness of the skin's micro-relief. **Mibelle** also supply AquaCacteen, an aqueous/glycolic extract from the cactus Opuntia ficus indica that has soothing and hydrating properties.

Clay masks and body treatments can be formulated using natural Pelavie clays, peats and silts from **The Innovation Company**. Pelavie Silts are fresh water sediments whereas Pelavie Peat comes from wetlands. Both are rich in humic acids and other bioactive compounds and offer detoxifying, firming, regenerating and balancing properties. There are many other muds and clays available including Rhassoul Clay from the Atlas Mountains of Morocco via **Unifect Ltd.**

Sticking a burning candle in the ear to drag out all the toxins from the brain may not appeal to anyone with a modicum of common sense but **Organics and Nature** supply Amazon Spa massage candles based on butters from Amazonian oils, which melt at body temperature. The idea being that the masseur lights the candle and drips the warm wax onto the body prior to the massage.

Suppliers of the materials mentioned should be asked for full INCI listings and proof of efficacy and for Ecocert certification where appropriate.

Ref 1 http://www.connock.co.uk/articles_exfoliants.htm

Ref 2 http://www.connock.co.uk/articles_particulates.htm

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www.creative-developments.co.uk