

# ZIRKONAL® L540

## Antiperspirant Active

INCI Name: Aluminum Zirconium Pentachlorohydrate

Empirical Formula:  $Al_7Zr(OH)_{20}Cl_5 \cdot nH_2O$

### Description

ZIRKONAL® L540 is an antiperspirant active, providing enhanced efficacy over Aluminium Chlorohydrates due to the precipitation of basic Aluminium Zirconium Chlorohydrate polymer complexes in the upper part of the sweat glands. A typical HPLC trace can be seen below, indicating the characteristic polymer distribution of Aluminium Zirconium Pentachlorohydrate.

### Chemical Properties

Aqueous / alcoholic solutions of ZIRKONAL® L540 are slightly acidic. At pH values > 5, insoluble Al/Zr Hydroxides precipitate out. On drying, the residue decomposes to HCl and Hydroxides. On further heating, to temperatures >100°C, the Hydroxides release water.

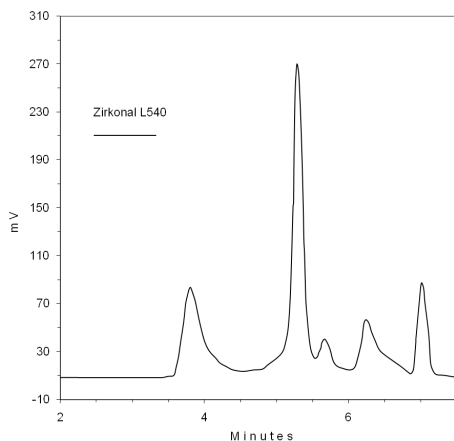
### Physiological Properties

According to the application area and concentration applied, ZIRKONAL® exhibits sweat reducing, deodorant, astringent, antibacterial and antiphlogistic properties.

### Application

ZIRKONAL® L540 is primarily used in aqueous, aqueous/alcoholic or emulsion formulations, e.g. roll-ons and creams, where maximum antiperspirant efficacy is required.

According to the FDA guidelines, only non-aerosol dosage forms are allowed. The maximum permitted concentration of ZIRKONAL® L540 is 20 %, calculated on an anhydrous basis, omitting from the calculation any buffer component present in the compound.



### General Data

|                      |                        |
|----------------------|------------------------|
| Form                 | ~ 40% aqueous solution |
| Aluminium            | 7,6 - 8,4 %            |
| Zirconium            | 3,7 - 4,3 %            |
| Chloride             | 6,5 - 7,5 %            |
| Atomic ratio (Al/Zr) | 6,0 - 8,1              |
| Iron                 | max. 50 ppm            |
| Heavy metals [as Pb] | max. 10 ppm            |
| pH [15 % solution]   | 3,5 - 4,5              |
| Density              | 1,26 - 1,30            |



| Raw Materials/<br>Trade name  | INCI name   | w/w<br>[%] |
|-------------------------------|---|------------|
| A. Ethanol                    | SD Alcohol 39-C   | 30,00      |
| <b>Zirkonal®<br/>L540 (1)</b> | Aluminum Zirconium<br>Pentachlorohydrate                      | 37,50      |
| Demin. water                  | water   | 29,80      |
| Natrosol 250<br>HHR (5)       | Hydroxyethylcellulose   | 0,30       |
| B. Perfume Oil                | Fragrance   | 0,80       |
| Cremophor<br>CO 455 (6)       | PEG-40 Hydrogenated<br>Castor Oil (and) Pro-<br>pylene Glycol | 1,60       |

| Raw Materials/<br>Trade name     | INCI name                                | w/w<br>[%] |
|----------------------------------|--|------------|
| A. Myrj 53 (2)                   | PEG-50 Stearate                          | 2,00       |
| Lanette 16 (4)                   | Cetyl Alcohol                            | 3,50       |
| Cobee 92 (3)                     | Hydrogenated Coco-<br>nut Oil            | 3,50       |
| B. Water                         | Water                                    | 50,50      |
| Tylose H4000<br>NG4 (5)          | Hydroxyethylcellulose                    | 0,50       |
| C. <b>Zirkonal®<br/>L540 (1)</b> | Aluminum Zirconium<br>Pentachlorohydrate | 40,00      |
| Preservatives                    |  | q.s.       |

## Safety

ZIRKONAL® L540 is an Aluminium Zirconium Pentachlorohydrate according to USP 32. The FDA Final Antiperspirant Monograph classifies ZIRKONAL® types under category 1, as safe and effective for use in non-aerosol, antiperspirant formulations.

## Packaging

ZIRKONAL® L540 (40% solution) is available in 150 kg PE drums or in 1000 kg containers.

## Storage

ZIRKONAL® types can be stored for more than 3 years in original, unopened containers. Once opened the material should be used quickly.

ZIRKONAL® solution should be protected from freezing and storage at high temperatures should be avoided.

## Antiperspirant Roll On A 62

### Procedure

**Part A:** Dissolve Natrosol 250 HHR, under high speed agitation, in water. Stir until material is completely dissolved. Add ethyl alcohol and **Zirkonal®** under stirring.

**Part B:** Mix Cremophor CO 455 and perfume oil.

Add part B to part A and stir well.

### Suppliers

- 1) BK Giulini
- 5) Aqualon/Hercules
- 6) BASF

## Antiperspirant Cream A 63

### Procedure

Heat phase A and phase B to 80 °C and afterwards emulsify phase A to phase B, under homogenisation. Cool to 50 °C and add the **Zirkonal®** under agitation.

### Suppliers

- 1) BK Giulini
- 2) ICI
- 3) California Oils Corp.
- 4) Cognis
- 5) Shin Etsu

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