

A sustainable porous spherical particle with improved texture and high oil absorptivity

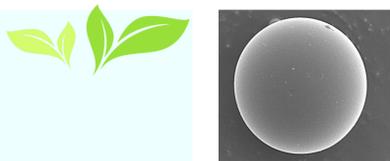
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Introduction:

“cellulose acetate particle” (TS-CA)
→ a naturally derived material
→ our original spherical particle that is both soft and eco-friendly



Preferable to improve oil absorption as a cosmetic ingredient

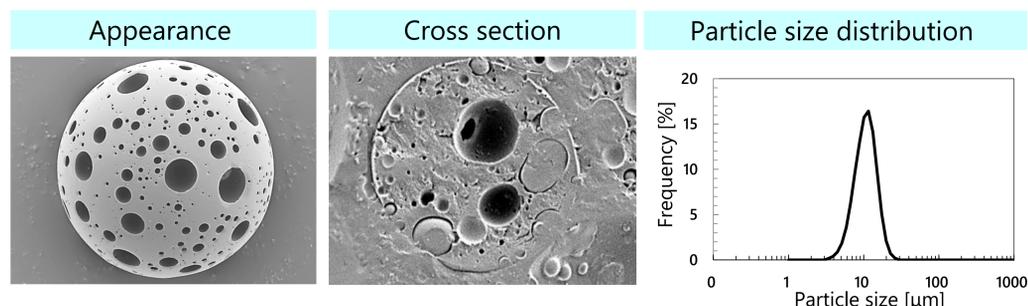


If TS-CA can be made porous. Increases oil absorption ??

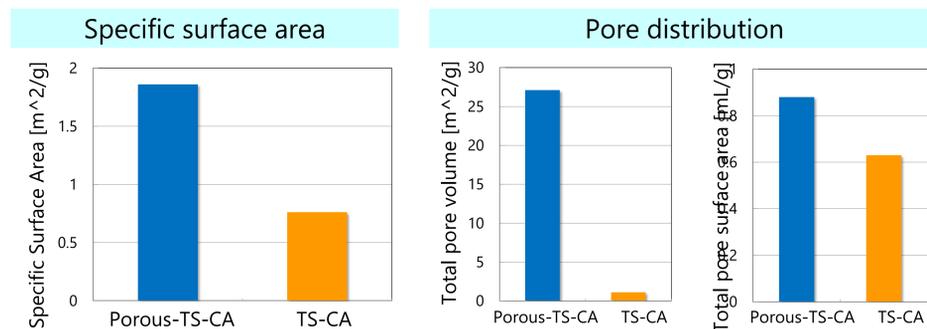
As a result

- we succeeded in developing a spherical porous cellulose acetate particle that absorbs large amounts of oil.
- In addition, we confirmed that the spherical porous cellulose acetate fine particle had improved softness compared to TS-CA.

Results & Discussion:



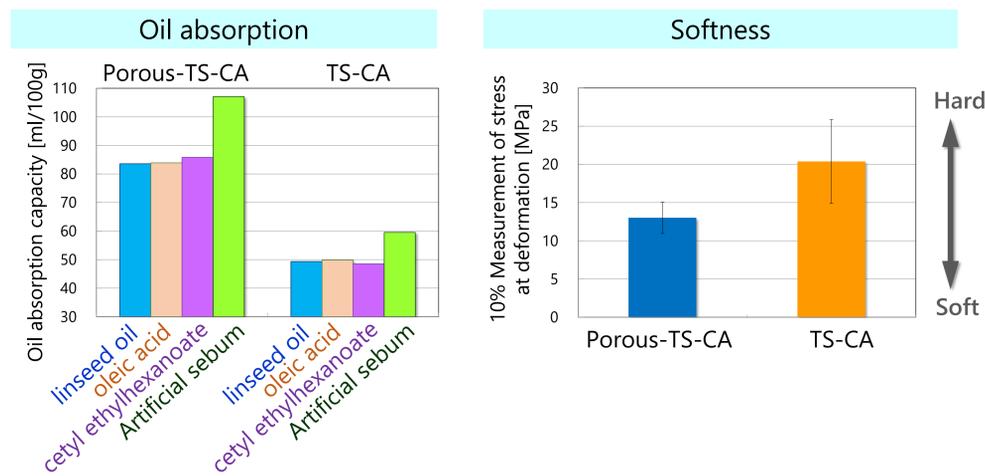
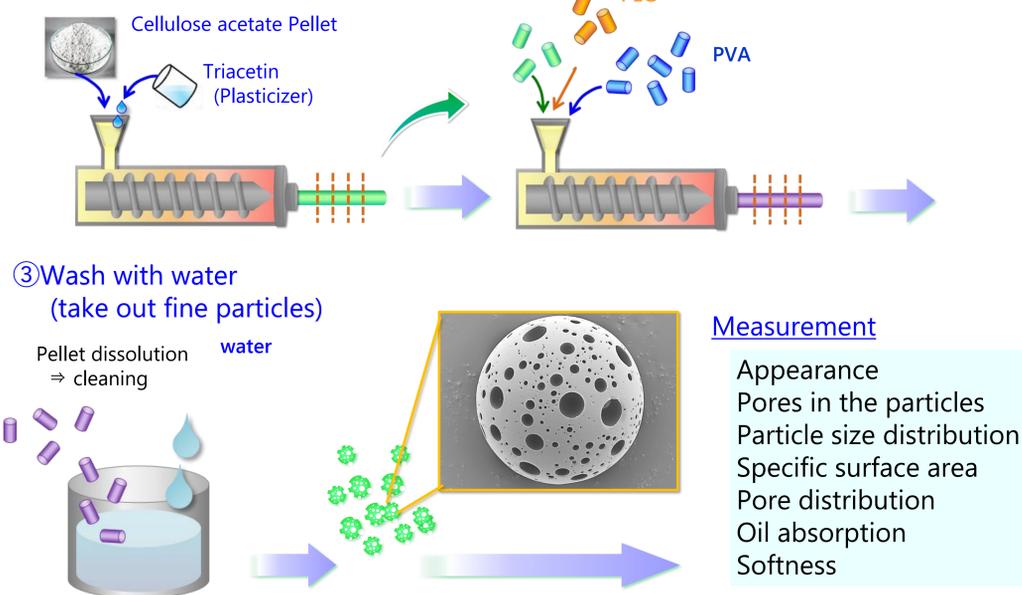
- The Porous TS-CA developed in this study was spherical and had pores on its surface.
- The Porous-TS-CA cross-section revealed that pores exist not only on the surface but also inside it.
- The particle size was confirmed to be approximately 10 μm .



- The specific surface area of Porous TS-CA was larger than that of TS-CA.
- The total pore surface area and total pore volume of Porous TS-CA were larger than those of TS-CA.

Materials & Methods:

- Cellulose acetate (CA) pellet preparation (melt kneading of CA and triacetin)
- CA pellet / PVA / PEG melt kneading
- Wash with water (take out fine particles)



- Porous-TS-CA was found to have considerably greater oil absorption capacity compared to TS-CA with all oils measured.
- It was also found that the amount of oil absorption can be varied arbitrarily by changing the size and number of the pores.
- The 10% deformation stress of Porous-TS-CA was found to be smaller than that of TS-CA, hence considered softer.
- Porous TS-CA with larger oil absorption amount had smaller 10% deformation stress values.

From these results, it was expected that among the pores of the porous TS-CA, the pores appearing on the particle surface are contributing to the increase in oil absorption, and the pores existing inside might be making the particles feel softer.

Conclusions:

The developed Porous TS-CA is a promising new eco-friendly cosmetic material with unique soft and oil absorption characteristics based on a variety of evidences. In addition, Porous-TS-CA can be applied to cosmetic formulations with high emollients, providing refreshing textures. Furthermore, its ability to absorb excess sebum may be effective for preventing the deterioration of foundations.

References:

- Kobayashi K (2020) A sustainable multi-purpose spherical particle with silky feel, Proceedings of The IFSCC Congress 2020 Yokohama, Poster-363: 3976-3981
- ISO 787-5 (1980) General methods of test for pigments and extenders—Part 5: Determination of oilabsorption value (IDT)