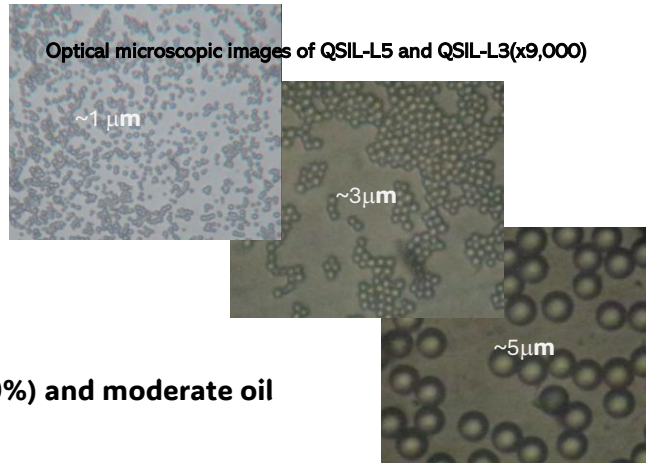
QSIL

One of a Kind Silica Particles



Optical microscopic images of QSIL-L5 and QSIL-L3(x9,000)

- **Amorphous (XRD)**
- **Unique chemical composition**
- **Completely free of nano particles**
- **Single molecular particles**
- **Mono-dispersion to multi-dispersion size distribution**
- **Up to 10 μm (average) on demand**
- **High silica purity (>99.9%)**
- **Low oil and water absorbency (30~50%) and moderate oil and water absorbency (50~90%)**
- **Excellent sensory**

Fumed silica

❖ Pyrolysis of $SiCl_4$ above 1000°C
- Primary particles are nano sized.
- Primary particles aggregate to form irregularly shaped larger particles.
- Aggregated particles are porous.
- Aggregated particles have high oil and water absorbency.

Stöber method

❖ Sol-gel reaction of TEOS
- Non-porous; low oil and water absorbency
- Unaffordable prices
- Difficult to get particles larger than 1 micrometer
- Particles larger than 1 micrometer are far more expensive.
- Almost monodisperse

Precipitated silica

❖ Precipitation of water glass
- Porous; high oil and water absorbency
- Primary particles are nano-sized.
- Primary particles aggregate (physically and chemically) to form spherical powders of different sizes.
- Mean particle size can be adjusted.

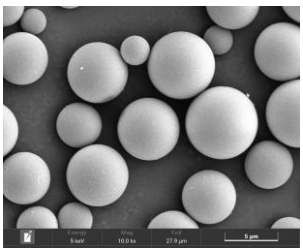
QSIL

❖ **Almost perfect spherical silica particles with hybrid features of Stöber and precipitated silica particles**
- **Non-porous, smooth surface, nearly perfect spherical particles, 1 to 10 micrometer diameter, low oil and water absorbency (30~50%) and moderate oil and water absorbency (50~90%), mono-dispersion to multi-dispersion size distributions**

❖ **Affordable price**

Factors affecting features of QSIL

- **Low concentration of free Si-OH**
  - Lower toxicity is expected.
  - Low water absorbency (30~50%)
- **Non-porous, smooth surface**
  - Low oil absorbency (30~50%)
  - Smooth and soft texture
- **Different composition of $(SiO_2)_4$ and $(SiO_2)_6$**
  - Offers a slight elastic sensation


SEM image of QSIL