Injectable Grade of Sucrose

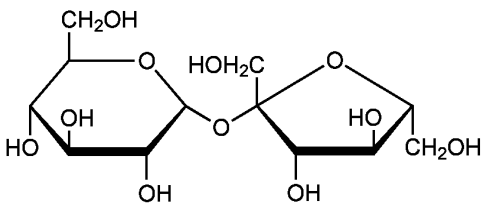
What is sucrose ?

- A disaccharide consisting of glucose and fructose joined by α-1,2 glycosidic bonds, it is mainly refined from sugar beet and sugarcane.
- Glucose's aldehyde group and fructose's ketone group form a glycosidic bond, so it does not have reducing properties and is considered a non-reducing sugar.
- A colorless crystal.
- Extremely soluble in water.
- Slightly soluble in methanol and insoluble in ethanol (95%).

SUCROSE SG

Sucrose structure

Chemical Formula : $C_{12}H_{22}O_{11}$
MW : 342.30
CAS RN® : 57-50-1

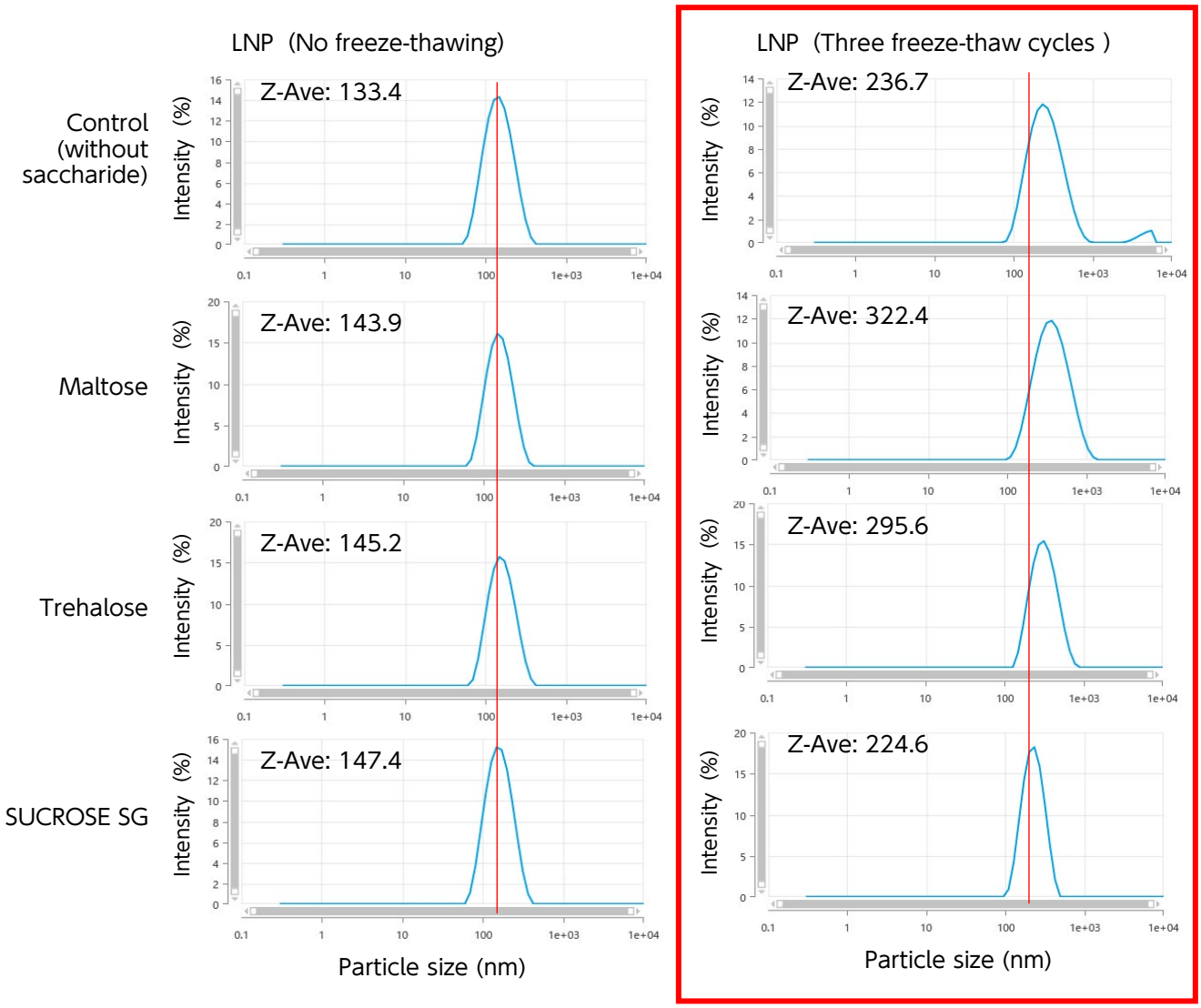


Applications and references

- Improved stability of mRNA LNP formulations against freeze-drying.
  - Lamoot A., *et al.* Biomater Sci. 11(12), p4327-4334 (2023)
    Ex.: Lipid Nano Particle (LNP) formulation
- Importance of selecting pharmaceutical additive sucrose with low nanoparticle impurities (NPI).
  - Weinbuch D., *et al.* Pharm. Res. 32, p2419-2427 (2015)
  - Weinbuch D., *et al.* Pharm. Res. 34, p2910-2921 (2017)
    Ex.: Therapeutic antibody
- Used as a freezing/cryoprotectant for liposomes.
  - Guimarães D., *et al.* Front. Bioeng. Biotechnol. 7, Article 424 (2019)
    Ex.: Freezing/cryoprotection of liposomes containing tamoxifen.

◆ IUPAC name : β-D-Fructofuranosyl α-D-glucopyranoside

Application study for lipid nano particles (LNP)



【Materials and Methods】

Prepared using Cayman's LNP preparation kit; LNP compositions were prepared by replacing sucrose in the Comirnaty® composition with the respective carbohydrate and subjected to freeze-thaw testing.

【Results】

After the freeze-thawing (-20°C, 1 hr ⇔ R.T., 0.5 hr), the addition of SUCROSE SG resulted in the least change in particle size. A trend towards larger particle size of LNP was observed under the others.

*LNP stabilization by freeze-thaw cycles.
(SUCROSE SG > Trehalose > Maltose > without saccharide)

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