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EvaGlo Oral Care: A Product & Ingredient Guide

This comprehensive booklet shares information on nano-hydroxyapatite and the other active ingredients in our formulations, including the expected patient outcomes and supporting research.

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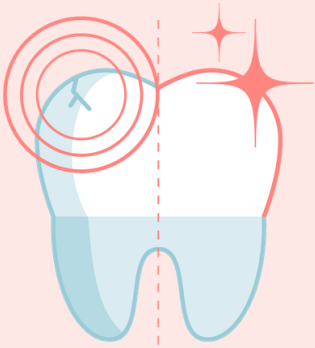
What is nano-hydroxyapatite and why are we using it in toothpaste?

$Ca_{10}(PO_4)_6(OH)_2$

Hydroxyapatite is included...

in toothpaste as a remineralising agent – an active ingredient that promotes the reintegration of calcium and phosphate ions into the tooth. Hydroxyapatite has recently gained popularity worldwide due to its biocompatibility with the structure of the tooth, its non-toxicity and safety for use in children, and the added benefits of naturally whitening teeth and reducing dentine sensitivity [1,2]. There are two forms of hydroxyapatite that are used in toothpaste, micro and nano. The difference between the two is the size of the crystallites. The hydroxyapatite crystals in the tooth enamel are 20 to 40 nm in size, therefore nano-hydroxyapatite has proved to be highly effective as a remineralising agent due to its structural and chemical similarity to the tooth [3].



Particle size and safety

Micro versus Nano

Both micro and nano-hydroxyapatite are capable of remineralisation of the teeth, however, there are some differences in their capabilities. The research suggests that nano-hydroxyapatite offers several advantages: superior remineralisation [4–6], enhanced enamel microhardness recovery [4,7], improved biofilm management [1] and relief of dentine hypersensitivity [8,9].

Assessed by the SCCS

Studies show no cytotoxicity (harm to cells) [10,11] and no risk of intestinal absorption if accidentally swallowed [12]. Additionally, the European Union's Scientific Committee on Consumer Safety (SCCS) has approved nano-hydroxyapatite for use in toothpaste with specific regulations regarding concentration, particle shape, and surface modifications. Based on these findings, EvaGlo has chosen to utilise nano-hydroxyapatite to create a toothpaste that is both effective and safe to use.

Keep your smile for a lifetime.

Clinical trials using hydroxyapatite

A randomised controlled 6-month trial that included 147 patients between the ages of 11 and 25 years.	Caries-active patients who used 10% hydroxyapatite toothpaste had reduced incidence of caries. There was no significant difference in caries progression between the hydroxyapatite group and the 1400 ppm F- group [13].
A double-blinded, randomised, active-controlled trial that included children between the ages of 3 and 7 years.	The study found that daily use of a hydroxyapatite toothpaste was equivalent to the standard fluoride control toothpaste (500 ppm F-) in preventing caries development in primary teeth [14].

According to two recent meta-analyses, these studies were found to have a low risk of bias and were considered to be some of the most reliable evidence on hydroxyapatite in caries prevention [15,16]. EvaGlo's nano-hydroxyapatite is of the same origin as the hydroxyapatite used in these studies.

The EvaGlo Range

Ingredient List

Glycerin, Calcium Carbonate, Aqua (Water), Nano-Hydroxyapatite (10%), Sorbitol, Xylitol, Aloe Barbadensis (Aloe Vera) Leaf Juice, Cellulose, Silica, Disodium Cocoyl Glutamate, Sodium Cocoyl Glutamate, Zinc Citrate, Xanthan Gum, Natural Flavouring, Camellia Sinensis (Green Tea) Leaf Extract, Mentha Piperita (Peppermint) Leaf Oil, Melaleuca Alternifolia (Tea Tree) Oil, Cinnamomum Zeylanicum (Cinnamon) Bark Oil, Eugenia Caryophyllata (Clove) Bud Oil, Glyceryl Caprylate, Trisodium Citrate, Limonene*, Linalool*, Eugenol*, Cinnamal*
*Naturally occurring essential oil compounds

Ingredient List

Glycerin, Aqua (Water), Calcium Carbonate, Nano-Hydroxyapatite (10%), Sorbitol, Xylitol, Aloe Barbadensis (Aloe Vera) Leaf Juice, Cellulose, Silica, Disodium Cocoyl Glutamate, Sodium Cocoyl Glutamate, Zinc Citrate, Vaccinium Macrocarpon (Cranberry) Fruit Extract, Camellia Sinensis (Green Tea) Leaf Extract, Xanthan Gum, Flavouring, Mentha Piperita (Peppermint) Leaf Oil, Levulinic Acid, Sodium Levulinate, Trisodium Citrate

Adults' Mint	Kids' Strawberry & Mint
Intense mint flavour.	Strawberry flavour with a hint of mint.
Contains essential oils to support the oral microbiome.	Contains cranberry extract, providing proanthocyanidins to support the remineralisation of primary teeth.
Mild abrasivity to gently remove plaque.	Contains a lower concentration of the abrasive (calcium carbonate) for an even gentler formula.
Suitable for all ages, but preferred by teens and adults.	Suitable from **1 year of age**.

Improved patient outcomes with a nano-hydroxyapatite toothpaste

	Key Findings	Patient Benefit
Remineralisation (restoring tooth minerals)	Due to its smaller particle size, nano-hydroxyapatite has a high surface area and a strong tendency to absorb and bind to the tooth [5].	This strong adhesion creates more sites for essential minerals, like calcium and phosphate, to be deposited back into weakened enamel, reversing the early stages of initial caries lesions.
	In vitro experiments, with fluctuating acidity levels (pH-cycling), showed that nano-hydroxyapatite may be equally or even more successful than fluoride in reversing initial caries lesions [17–19].	Repairs the early stages of tooth decay before it progresses into a cavity that requires a filling. This saves patients the discomfort of more invasive dental procedures and prevents tooth loss.
	An in vitro study found that nano-hydroxyapatite promoted enamel remineralisation around the edges (margins) of dental fillings [20].	Nano-hydroxyapatite could make the enamel around dental fillings more resistant to new cavities and thus extend the lifespan of the fillings.
Repairs microscratches	Using a scanning electron microscope it has been found that a toothpaste formulation, with 10% nano-hydroxyapatite, filled enamel porosities and created a smoother enamel surface. In contrast, fluoride toothpaste in the same study resulted in a rougher enamel surface [7].	Reduced plaque adhesion: bacteria in plaque are more likely to adhere to a rough, uneven surface. A smoother enamel surface, created by nano-hydroxyapatite, can make it more difficult for plaque to accumulate, potentially reducing the risk of cavities and gum disease.
Microhardness recovery	At 10% inclusion level, nano-hydroxyapatite was as effective as a 2200ppm sodium monofluoride formulation [7].	Microhardness recovery with nano-hydroxyapatite helps the enamel regain its strength, making it more resistant to wear and tear, potentially extending the lifespan of healthy teeth.

Builds a new protective layer of enamel	Forms a new homogenous surface layer [4].	The new layer might act as a physical barrier against harmful substances like acids produced by plaque bacteria.
Biofilm management	Nano-hydroxyapatite can adsorb to the bacterial cell wall and prevent bacteria from attaching to the tooth surface [1]. This may support oral microbiome management by reducing bacterial adhesion to the tooth surface, rather than through an antimicrobial mechanism.	Improved patient benefits may include reduced plaque formation, improved gum health, fresher breath, and a reduced risk of cavities.
Dentine hypersensitivity	Due to its nano size, nano-hydroxyapatite can occlude open dentine tubules. This reduces fluid flow in the tubules and blocks pain signals [9].	Open dentine tubules are tiny channels that connect the inner pulp of the tooth to the outer surface. When exposed due to gum recession, worn enamel, or other factors, these tubules can allow hot, cold, sweet, or acidic stimuli to reach the tooth's sensitive nerves, causing discomfort known as dentine hypersensitivity. By occluding these tubules, nano-hydroxyapatite can significantly reduce the transmission of these stimuli, leading to less pain and improved quality of life.
Tooth whitening	Teeth whitening has become increasingly popular, with options ranging from professional treatments to over-the-counter products. Whitening treatments, especially those using high concentrations of peroxide, can temporarily cause tooth sensitivity [21].	Applying nano-hydroxyapatite before a whitening procedure can help reduce sensitivity [22]. Utilising nano-hydroxyapatite after whitening with photo or chemo catalysed bleaching agents has been shown to provide immediate relief to hypersensitivity [23].
	Nano-hydroxyapatite whitens teeth by creating a new protective surface layer that blocks incoming light and reflects white light. Additionally, it is mildly abrasive and effective at removing stains and plaque [21].	Patients can experience the benefit of a whiter smile without the risk of developing hypersensitivity. The longevity of a patient's white smile may be extended as they age, potentially supporting overall self-confidence.

Additional active ingredients

Ingredient	Active Compounds	Key Findings	Patient Benefit
Zinc citrate	Zinc ions	Has been shown to limit bacterial growth and inhibit plaque formation [24]. Zinc, incorporated alongside citrate, demonstrates anti-calculus action [25].	**Therapeutic**: Reduces plaque formation. **Cosmetic**: Prevents calculus formation.
Xylitol		Xylitol has an active role in disrupting the energy production pathways of cariogenic bacteria, leading to a subsequent reduction in acid production, and benefiting the remineralisation process [26].	**Reduced Risk of Cavities**: Cariogenic bacteria, such as S. mutans, are primary contributors to the formation of cavities. **Enhanced Remineralisation**: Xylitol may facilitate remineralisation by raising the pH of the oral cavity above 5.5.
Aloe vera (Aloe Barbadensis)	Aloesin, aloin, aloeride, naftoquinones, methylchromes, flavonoids, saponin, sterols.	Aloe vera has been shown to improve plaque, gingival and gingival bleeding indices [27]. Aloe vera has a significant anti-inflammatory property and it has been shown to be particularly beneficial in reducing gingival inflammation [28].	**Improved Gum Health**: Chronic inflammation releases enzymes that break down collagen, the main protein that provides structure and support to the gum tissue. This breakdown weakens the gums, making them more susceptible to damage and recession. It also increases the permeability of blood vessels in the gums, allowing more fluids and inflammatory cells to leak into the gum tissue, causing swelling and redness.

Green Tea Extract (Camellia Sinensis)	Polyphenol compounds (catechins): Epigalloccatechin-3 gallate (EGCG) and epicatechin-3-gallate (ECG).	A study examined green tea's ability to influence biofilm formation by S. mutans bacteria. The results showed green tea extract inhibited biofilm formation at various concentrations, suggesting its potential to modulate biofilm development [29].	**Reduced Risk of Cavities**: Biofilms, especially those dominated by S. mutans bacteria, are a major contributor to the formation of cavities. **Improved Gum Health:** Biofilms can also contribute to gum disease (gingivitis and periodontitis) by irritating the gums and creating an environment for harmful bacteria to thrive.
Clove Bud Essential Oil (Eugenia Caryophyllata)	Eugenol, acetyleugenol, gallic acid, sesquiterpenes, furfural and vanillin.	E. Caryophyllata has demonstrated antibacterial activity against cariogenic and periodontopathogenic bacteria, which may suggest that it acts as a natural antibacterial agent [30].	**Reduced Risk of Cavities**: Cariogenic bacteria, such as S. mutans, are primary contributors to the formation of cavities.
Cinnamon Bark Essential Oil (Cinnamomum Zeylanicum)	Cinnamaldehyde, eugenol, phenol, linalool.	C. Zeylanicum expressed the strongest inhibitory effect against S. mutans bacteria [31–33].	**Reduced Risk of Cavities**: S. mutans is a primary contributor to the formation of cavities.
Tea Tree Essential Oil (Melaleuca Alternifolia)	Terpinen-4-ol, 1,8-cineole, α-terpinene, γ-terpinene, α-pinene, β-pinene, α-terpineol, p-cymene, and sesquiterpene alcohols.	M. Alternifolia concentration has been shown to have an inverse relationship with plaque scores and the gingival bleeding index. With an increasing concentration, there was a continuous improvement in these scores [34].	**Reduced Plaque Formation and Improved Gum Health**
Cranberry Extract (Vaccinium macrocarpon)	Phenolic acids, anthocyanins, flavonols, flavan-3-ols and procyanidins [33].	Due to the proanthocyanidin content in the cranberry extract, it was found to promote remineralisation on the superficial layer of initial caries lesions in primary teeth. This was accompanied by an effective reduction in bacterial count and an increase in microhardness [36].	**Enhanced Remineralisation**: Cranberry extract may be an effective plant-based remineralisation agent that can be used in conjunction with fluoride or nano-hydroxyapatite to support remineralisation.

Why Choose EvaGlo Nano-Hydroxyapatite Toothpaste?

EvaGlo stands out for its commitment to optimal effectiveness and transparency. Our toothpaste is designed to deliver comprehensive oral care with a focus on natural ingredients and scientifically supported benefits. Here's what sets us apart:

- **Effective Concentration:** EvaGlo utilises a 10% concentration of nano-hydroxyapatite. This specific concentration is supported by multiple scientific studies, demonstrating its efficacy in remineralisation, enamel strengthening, and reducing dentine hypersensitivity.
- **Natural Ingredients with Targeted Benefits:** EvaGlo incorporates natural ingredients alongside nano-hydroxyapatite to promote oral health.
- **Transparency in Formulation:** We prioritise transparency with our formulation. We clearly list all ingredients and specify the 10% nano-hydroxyapatite concentration on our packaging, allowing you and your patients to make informed decisions.
- **Safety:** All ingredients are food grade and are safe if swallowed.

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Read More: Knowledge Hub

- What is hydroxyapatite and why are we using it in toothpaste?
- Micro and Nano Hydroxyapatite: Which is Better for Your Teeth?
- Start Healthy Smiles Early: A Paediatric Dentist's Guide
- Nano-hydroxyapatite toothpaste vs. a CPP-ACP crème

Frequently asked questions by professionals

References

1. Chen, L.; Al-bayatee, S.; Khurshid, Z.; Shavandi, A.; Brunton, P.; Ratnayake, J. Hydroxyapatite in Oral Care Products — A Review. Materials. **2021**, 14, 4865–4885.
2. Meyer, F.; Enax, J.; Amaechi, B.T.; Limeback, H.; Fabritius, H.; Ganss, B.; Pawinska, M.; Paszynska, E. Hydroxyapatite as Remineralization Agent for Children' s Dental Care. Front. Dent. Med. **2022**, 3, 1–10, doi:10.3389/fdmed.2022.859560.
3. Anil, A.; Ibraheem, W.I.; Meshni, A.A.; Preethanath, R.; Anil, S. Demineralization and Remineralization Dynamics and Dental Caries. In Dental Caries - The Selection of Restoration Methods and Restorative Materials; Rusu, L.-C., Ardelean, L.C., Gehrke, S.A., Eds.; IntechOpen, **2022** ISBN 978-1-80356-360-2.
4. Huang, S.; Gao, S.; Cheng, L.; Yu, H. Remineralization potential of nano-hydroxyapatite on initial enamel lesions: An in vitro study. Caries Res. **2011**, 45, 460–468, doi:10.1159/000331207.
5. Grohe, B.; Mittler, S. Advanced non-fluoride approaches to dental enamel remineralization: The next level in enamel repair management. Biomater. Biosyst. **2021**, 4, 100029, doi:10.1016/j.bbiosy.2021.100029.
6. Roveri, N.; Battistella, E.; Bianchi, C.L.; Foltran, I.; Foresti, E.; Iafisco, M.; Lelli, M.; Naldoni, A.; Palazzo, B.; Rimondini, L. Surface Enamel Remineralization : Biomimetic Apatite Nanocrystals and Fluoride Ions Different Effects. **2009**, 2009, doi:10.1155/2009/746383.
7. Juntavee, A.; Juntavee, N.; Sinagpulo, A.N. Nano-Hydroxyapatite Gel and Its Effects on Remineralization of Artificial Carious Lesions. Int. J. Dent. **2021**, doi:10.1155/2021/7256056.
8. Melo, C. De; Lucy, B.; Paula, F. De; Ivette, M.; Ortiz, G.; Baraúna, M.; Martins, C.; Cople, L. Clinical efficacy of nano-hydroxyapatite in dentin hypersensitivity: A systematic review and meta-analysis. **2019**, 82, 11–21, doi:10.1016/j.jdent.2018.12.014.
9. Limeback, H.; Enax, J.; Meyer, F. Clinical Evidence of Biomimetic Hydroxyapatite in Oral Care Products for Reducing Dentin Hypersensitivity : An Updated Systematic Review and Meta-Analysis. **2023**.
10. Coelho, C.C.; Grenho, L.; Gomes, P.S.; Quadros, P.A.; Fernandes, M.H. Nano-hydroxyapatite in oral care cosmetics: characterization and cytotoxicity assessment. Sci. Rep. **2019**, 9, 1–10, doi:10.1038/s41598-019-47491-z.
11. Kavasi, R.; Coelho, C.C.; Platania, V.; Quadros, P.A.; Chatzinikolaidou, M. In Vitro Biocompatibility Assessment of Nano-Hydroxyapatite. Nanomaterials **2021**, 11, doi:/10.3390/nano11051152.
12. Ramis, J.M.; Coelho, C.C.; Córdoba, A.; Quadros, P.A.; Monjo, M. Safety Assessment of Nano-Hydroxyapatite as an Oral Care Ingredient according to the EU Cosmetics Regulation. Cosmetics 2018, 5, doi:/10.3390/cosmetics5030053.
13. Schlagenhauf, U.; Kunzelmann, K.H.; Hannig, C.; May, T.W.; Hösl, H.; Gratza, M.; Viergutz, G.; Nazet, M.; Schamberger, S.; Proff, P. Impact of a non-fluoridated microcrystalline hydroxyapatite dentifrice on enamel caries progression in highly caries-susceptible orthodontic patients: A randomized, controlled 6-month trial. J. Investig. Clin. Dent. 2019, 10, e12399, doi:10.1111/jicd.12399.
14. Paszynska, E.; Pawinska, M.; Gawriolek, M.; Kaminska, I.; Otulakowska-Skrzynska, J.; Marczuk-Kolada, G.; Rzatowski, S.; Sokolowska, K.; Olszewska, A.; Schlagenhauf, U.; et al. Impact of toothpaste with microcrystalline hydroxyapatite on the occurrence of early childhood caries: a 1-year randomized clinical trial. Sci. Rep. 2021, 11, 1–15, doi:10.1038/s41598-021-81112-y.
15. Limeback, H.; Enax, J.; Meyer, F. Biomimetic Hydroxyapatite and Caries Prevention: A Systematic Review and Meta-Analysis. Can. J. Dent. Hyg. 2021, 55, 148–159.
16. Pawinska, M.; Paszynska, E.; Amaechi, B.T.; Meyer, F.; Enax, J.; Limeback, H. Clinical Evidence of Caries Prevention by Hydroxyapatite: An Updated Systematic Review and Meta-Analysis. J. Dent. 2024, 151, 105429, doi:10.1016/j.jdent.2024.105429.
17. Huang, S.B.; Gao, S.S.; Yu, H.Y. Effect of nano-hydroxyapatite concentration on remineralization of initial enamel lesion in vitro. Biomed. Mater. 2009, 4, doi:10.1088/1748-6041/4/3/034104.
18. Tschoppe, P.; Zandim, D.L.; Martus, P.; Kielbassa, A.M. Enamel and dentine remineralization by nano-hydroxyapatite toothpastes. J. Dent. 2011, 39, 430–437, doi:10.1016/j.jdent.2011.03.008.
19. Najibfard, K.; Ramalingam, K.; Chedjieu, I.; Amaechi, B. Remineralization of early caries by a nano-hydroxyapatite dentifrice. J. Clin. Dent. 2011, 22, 139–143.
20. Juntavee, N.; Juntavee, A.; Plongniras, P. Remineralization potential of nano-hydroxyapatite on enamel and cementum surrounding margin of computer-aided design and computer-aided manufacturing ceramic restoration. Int. J. Nanomed. 2018, 13, 2755–2765.
21. Limeback, H.; Meyer, F.; Enax, J. Tooth Whitening with Hydroxyapatite: A Systematic Review. Dent J (Basel) 2023, 11, 50, doi:10.3390/dj11020050.
22. Murr, C.G.; Favoreto, M.W.; da Silva, K.L.; Borges, C.P.F.; Loguercio, A.D.; Reis, A.; Antunes, S.R.M. Synthesis and Characterization of Different Nano-Hydroxyapatites and Their Impact on Dental Enamel Following Topical Application for Dental Bleaching. J Dent 2024, 149, 105291, doi:10.1016/j.jdent.2024.105291.
23. Mohamed, H.; Fayed, A.; Elkassas, D.; Hassanien, O. Impact of Using Nano-Hydroxyapatite on Postoperative Hypersensitivity of Two Bleaching Techniques – Randomized Controlled Clinical Trial. IOP Conf Ser Mater Sci Eng 2021, 1046, 012004, doi:10.1088/1757-899X/1046/1/012004.
24. Vranic, E.; Lacevic, A.; Mehmedagic, A.; Uzunovic, A. Mouthwash and toothpaste formulation. Bosn. J. Basic Med. Sci. 2004, 4, 51–58.
25. Phan, T.N.; Buckner, T.; Sheng, J.; Baldeck, J.D.; Marquis, R.E. Physiologic actions of zinc related to inhibition of acid and alkali production by oral streptococci in suspensions and biofilms. Oral Microbiol. Immunol. 2004, 19, 31–38, doi:10.1046/j.0902-0055.2003.00109.x.
26. Mickenautsch, S.; Yengopal, V. Anticariogenic effect of xylitol versus fluoride – a quantitative systematic review of clinical trials. Int. Dent. J. 2012, 62, 6–20, doi:10.1111/j.1875-595X.2011.00086.x.
27. Alnouri, D.M.A.; Kouchaji, C.; Nattouf, A.H.; AlSayed Hasan, M.M.A. Effect of aloe vera mouthwash on dental plaque and gingivitis indices in children: A randomized controlled clinical trial. Pediatr. Dent. J. 2020, 30, 1–8, doi:10.1016/j.pdj.2020.01.001.
28. Ajmera, N.; Chatterjee, A.; Goyal, V. Aloe vera: It's effect on gingivitis. J. Idian Soc. Periodontol. 2013, 17, 435–438, doi:10.4103/0972-124X.118312.
29. Zayed, S.M.; Aboulwafa, M.M.; Hashem, A.M.; Saleh, S.E. Biofilm formation by Streptococcus mutans and its inhibition by green tea extracts. AMB Express 2021, 11, doi:10.1186/s13568-021-01232-6.
30. Moon, S.-E.; Kim, H.-Y.; Cha, J.-D. Synergistic effect between clove oil and its major compounds and antibiotics against oral bacteria. Arch. Oral Biol. 2011, 56, 907–916, doi:https://doi.org/10.1016/j.archoralbio.2011.02.005.
31. Chaudhari, L.K.D.; Jawale, B.A.; Sharma, S.; Kumar, H.S.C.M.; Kulkarni, P.A. Antimicrobial Activity of Commercially Available Essential Oils Against Streptococcus mutans. J Contemp Dent Pr. 2012, 13, 71–74, doi:10.5005/jp-journals-10024-1098.
32. Wiwattanarattanabut, K.; Choonharuangdej, S.; Srithavaj, T. In Vitro Anti-Cariogenic Plaque Effects of Essential Oils Extracted from Culinary Herbs. J Clin Diagn res 2017, 11, DC30–DC35, doi:10.7860/JCDR/2017/28327.10668.
33. Karadağlıoğlu, Ö.İ.; Ulusoy, N.; Başer, K.H.C.; Hanoğlu, A.; Şık, İ. Antibacterial activities of herbal toothpastes combined with essential oils against streptococcus mutans. Pathogens 2019, 8, doi:10.3390/pathogens8010020.
34. Raut, C.P.; Sethi, K.S. Comparative evaluation of co-enzyme Q10 and Melaleuca alternifolia as antioxidant gels in treatment of chronic periodontitis: A clinical study. Contemp. Clin. Dent. 2016, 7, 377–381, doi:10.4103/0976-237X.188572.
35. Dudonné, S.; Varin, T. V.; Anhê, F.F.; Dubé, P.; Roy, D.; Pilon, G.; Marette, A.; Levy, É.; Jacquot, C.; Urdaci, M.; et al. Modulatory effects of a cranberry extract co-supplementation with Bacillus subtilis CU1 probiotic on phenolic compounds bioavailability and gut microbiota composition in high-fat diet-fed mice. ParmaNutrition 2015, 3, 89–100, doi:/10.1016/j.phanu.2015.04.002.
36. Pushpalatha, C.; Sneha, N.; Deveswaran, R.; Anandakrishna, L. Assessment of Remineralisation Potential of Cranberry Extract and Grape Seed Extract Dentifrice on Primary Teeth Using Laser Fluorescence Device. In Emerging Trends in Photonics, Signal Processing and Communication Engineering, Lecture Notes in Electrical Engineering; Springer Nature Singapore Pte Ltd., 2020; pp. 185–193.

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