奈米矽片(clay nanoplate)國際標準規範，於2023年6月正式由ISO出版

這是第一個由台灣主導撰寫，將ISO奈米技術成果寫成國際標準規範，由奈米協會秘書長宋清潭博士與台灣大學林江珍榮譽教授，歷經4年從2019-2023提案、立案、審查、答辯、國際專家修訂等流程，於2023年6月正式出版。

http://www.tanida.org.tw/index_e.php

ISO/TS 4971:2023

- 2019/11：ISO/TC 229 plenary meeting中以亞洲奈米論壇專家代表的身份於會議中提案
- 2021/4：由ISO/TC 229會員國進行投票，獲得有投票會員國一致同意，進入工作草案階段註冊為ISO TS 4971
- 2023/5：再獲得投票會員國一致同意本草案最終內容
- 2023/6：由ISO正式出版

1. 國際間有關奈米矽片(clay nanoplate)材料的品質控制，均參考此ISO奈米技術標準文件量測方法(含奈米矽片的物理及化學特性)
2. 可以測量和預測使用奈米矽片的懸浮液對細菌的群體淬滅(Quorum Quenching)性能評估和抗菌功效
3. **抑制農作物病原菌的生長，從而保護農作物免受疾病侵害，並且在農作物種植過程中可以減少或不使用化學農藥，進一步提高農作物收成**

奈米矽片(clay nanoplate)國際標準規範，於2023年6月正式由ISO出版

TECHNICAL COMMITTEES
ISO/TC 229
Nanotechnologies

Date Aug. 02, 2023

The ISO/TS 4971 standard "Nanotechnologies - Performance Evaluation of Nanosuspension Containing Clay Nanoplates for Quorum Quenching" had published by ISO in June 2023. This standard is led by Asia Nano Forum (ANF), and project leaders are Dr. Tsing-Tang Song from ITRI Taiwan and Prof. Jiang-Jen Lin from National Taiwan University. ANF submitted this proposal to the ISO/TC 229 at the plenary meeting on 13 November 2019, and ISO/TC 229 approved it as a new project in April 2020.

This standard provides characteristics and measurement methods, including chemical composition, mineral composition, specific surface area, cation exchange capacity, hydrodynamic size, and zeta potential for the clay nanoplate. These essential characteristics of clay nanoplate can provide an understanding of the potential quorum quenching ability and antibacterial performance. This standard is used as the quality control of clay nanoplate, and more importantly, the quorum quenching ability and antimicrobial efficacy by using clay nanoplates can be measured and predicted. The clay nanoplate suspension in water is designed to inhibit the growth of pathogenic bacteria for crop protection from diseases. Moreover, as an additional benefit, harvesting yield increased.

This standard describes the measurement methods of the interaction of clay nanoplates with bacterial signaling molecules and bacterial surfaces, including the quorum quenching ability by surfactants, the determination of minimum inhibitory concentration, and determination of minimum bactericidal concentration. The relationship between clay nanoplate characteristics and antibacterial performance is described in Annex A. The correlation between quorum quenching ability and antibacterial performance is described in Annex B, and the safety of clay nanoplate is described in Annex C.

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Nanotechnologies — Performance evaluation of nanosuspensions containing clay nanoplates for quorum quenching　　ISO奈米技術標準文件量測方法

1. 奈米矽片的物理及化學特性方法
   - 化學組成(Chemical composition)
   - 礦物組成(Mineral composition)
   - 比表面積(Specific surface area)
   - 陽離子交換容量(Cation exchange capacity)
   - 流體直徑(Hydrodynamic size)
   - 界面電位(Zeta potential)
2. 在群體淬滅的性能(Performance of quorum quenching)
   - 界面活性劑對群體感應抑制能力的量化(Quantification of quorum quenching ability by surfactants)
   - 最低殺菌濃度量測(Determination of minimum inhibitory concentration)
   - 最低殺菌濃度量測(Determination of Minimum bactericidal concentration)
3. 奈米矽片特性與抗菌性能關係(Relationship between clay nanoplate characteristics and antibacterial performance)
4. 奈米矽片群體感應抑制能力與抗菌功能相關性(Correlation between quorum quenching ability and antibacterial performance)
5. 奈米矽片的安全性(Safety of clay nanoplates)

https://www.iso.org/standard/80540.html