

## **Evaluation method of penetration speed of cosmetic liquid into skins using terahertz technology**

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The penetration speed of a cosmetic liquid into human skin is recognized as an important parameter for developing cosmetics. A terahertz time-of-flight (THz-TOF) method was applied to nondestructively evaluate the penetration speed. In contrast to the conventional THz-TOF method that utilizes THz pulses traveling through free space, skins were directly mounted on the Si-based THz emitter in the THz-TOF method. The difference between penetration speeds for tap water and coconut oil was clearly observed using the proposed method. Additionally, mixing ratio dependence was observed with respect to the penetration speed for an ethanol and distilled water mixture. These results indicated that the THz-TOF method with the silicone-based THz emitter could be a potentially useful option for evaluating cosmetic liquids.