

**Abstract citation ID: wxae035.020****55 Dissolution of inorganic lead compounds in synthetic sweat to assess workplace risk of dermal exposure**

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Over 1.4 million U.S. workers have dermal exposures to iPb compounds. Studies suggest that these dermal exposures could increase blood lead levels (BLLs) by as much as 6.3 µg/dL. However, little data is available on the dissolution of iPb compounds in skin surface film liquids (SSFLs) to determine the potential for Pb ion formation. Dissolution measures ion formation in SSFLs and can be influenced by interactions with the components in SSFLs. Dissolution data is useful for modeling bioavailability via dermal absorption using the concentration of ions in sweat and the permeation rate ( $K_p$ ) through the skin. The study objectives were: 1) determine the pH-dependent static dissolution and kinetics of iPb compounds in SSFLs: Pb<sup>2+</sup> nitrate (PbN), Pb<sup>2+</sup> acetate (PbA), Pb<sup>2+</sup> oxide (PbO), Pb<sup>2+/4+</sup> red oxide (PbRO); and 2) provide screening estimates of the potential impact of these compounds on BLLs. Estimated concentration of Pb ions available was used along with available  $K_p$  values to provide an understanding of the potential dermal bioavailability of these compounds.

The iPb compounds are bioaccessible in SSFLs; dissolution of PbN and PbA at 8 h was 36.4–61.1% compared to 0.01–2.5% for PbO and PbRO. Screening estimates suggest that BLLs may be increased by 0.7–8 µg/dL for these iPb compounds. The screening level estimates based on this model suggest that the impact on BLLs warrants a more comprehensive assessment. More research is needed including dissolution of iPb particles from industrial settings and the impact of particle size on dissolution.