Lead Sinkers in the Shower: Effects on water lead and human exposure

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Marc Edwards
Question 1: Would 1 lead sinker placed in a faucet increase water lead?
Answer: For 1 Brand New Lead Sinker placed in Detroit Water with 6 hour stagnation

First Draw Lead = 91,500 ppb

Answer: For 1 “aged”* lead sinker with passive phosphate layer, in Detroit Water with 6 hour stagnation

Lead = 2 ppb

*lead sinker exposed to Detroit water with extra 400 mg/L P, to accelerate phosphate scale formation and simulate a year of passivation based on “CT” concept
Question 2: Would lead sinkers packed into a shower increase water lead?
Answer: First flush shower water no stagnation

First Draw Lead = 5,800 ppb
Question 3: Would taking a shower/bath in leaded water cause significant human lead exposure of health concern (without drinking the water)?

Approach: Dr. Edwards took a 20 minute hot shower in the leaded water using an “ultra low flow” 0.5 gallon per minute showerhead that maximizes aerosols, then took a 20 minute bath in the leaded water to maximize possible skin absorption.*

Subject was careful to not drink the water. Human exposure and lead uptake was assessed with 3 sequential urine samples immediately before and after showering.

*Dr. Edwards has worked on lead in water issues for 30 years– we do not recommend that anyone try this at home.
No significant increase/change in urine lead after showering

Average Urine Lead Before = 0.36 ppb

Urine Lead Before Showering/Bathing

Hours before showering

Average Urine Lead After = 0.26 ppb

Urine Lead After Showering/Bathing

Hours after showering
Question 4: How much lead was in the “steam” of a leaded shower?

Approach: Collect steam water samples condensed on mirror.

Answer: 0.0 ppb Pb

This is expected because “steam” is distilled water.
Conclusions

• A single new lead sinker placed in a faucet with Detroit water, can cause water lead to spike to 96,000 ppb

• A single lead sinker passivated with phosphate, then placed in a faucet with Detroit water, can increase water lead as little as 2 ppb

• Placing a lead sinker into a faucet can therefore increase water lead from at least 2 to 96,000 ppb, dependent on circumstance

• “Steam” has undetectable lead, because it is distilled water.

• Taking a shower or bath in leaded water, is not a significant source of human exposure, consistent with long-standing expectations based on medical advice and scientific literature