

US EPA ARCHIVE DOCUMENT

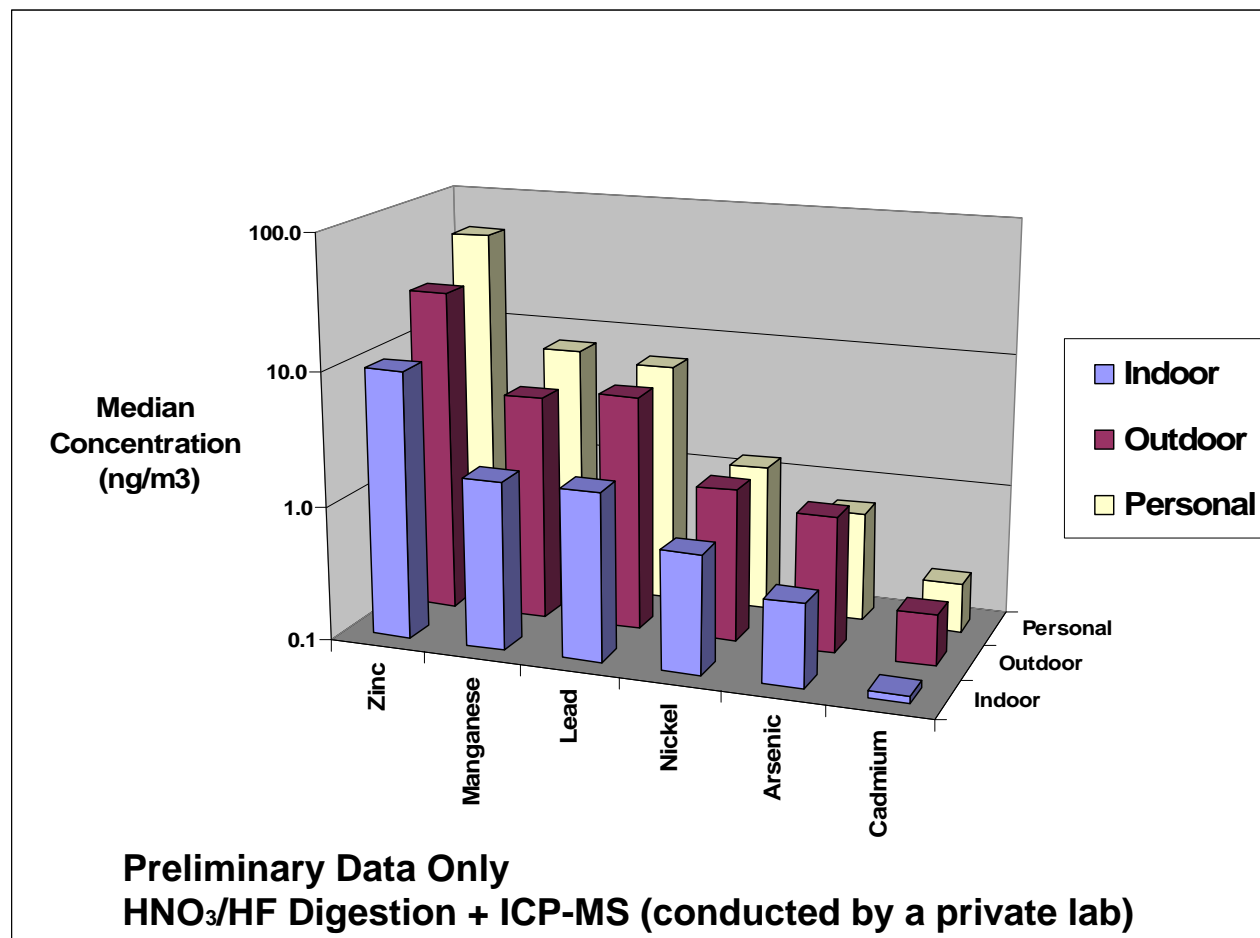
Development of SOP for Personal, Indoor and Outdoor Monitoring of Airborne Metals

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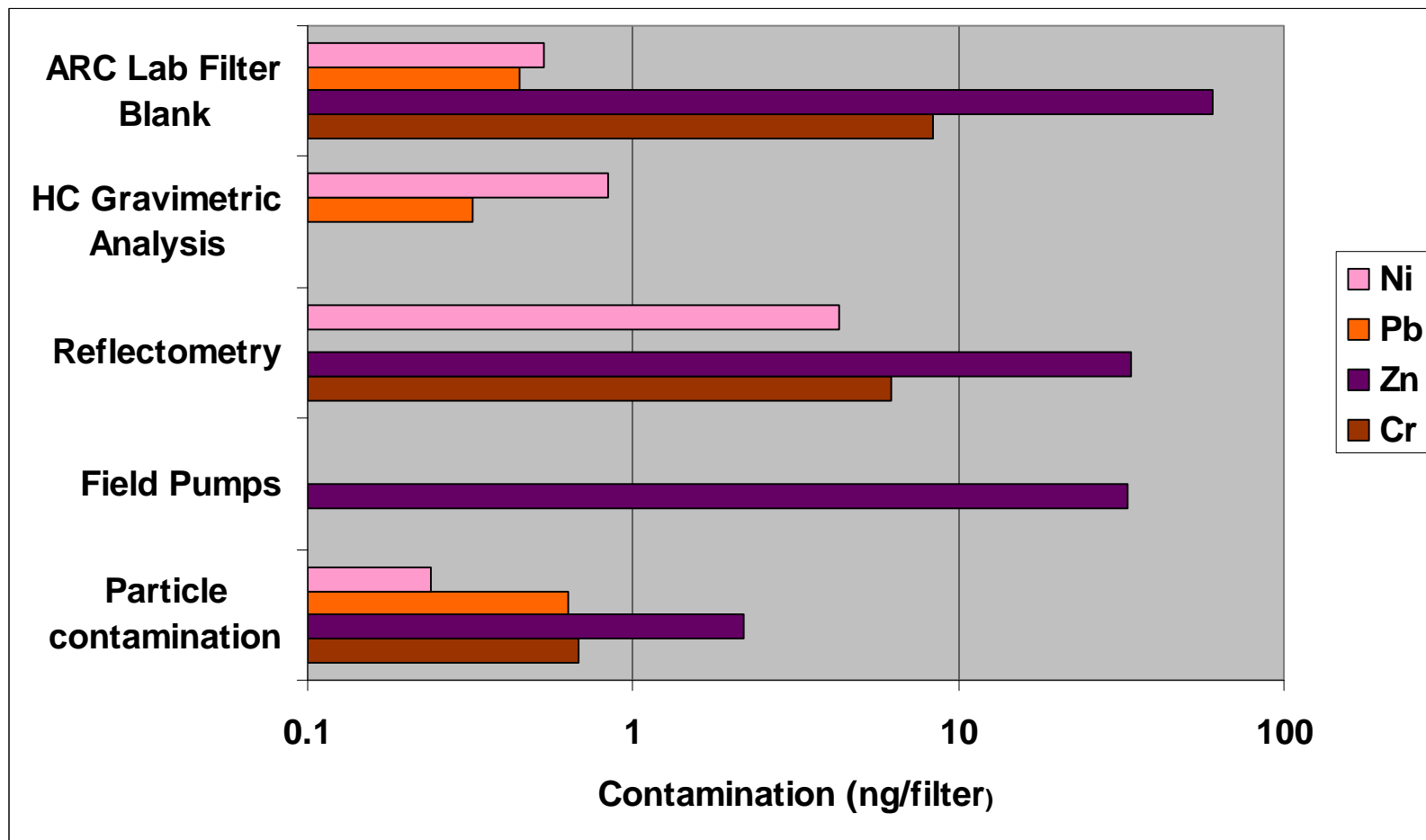
Windsor Pilot Study Results

(n = 8 matched PM_{2.5} sets; particle mass >60 µg)



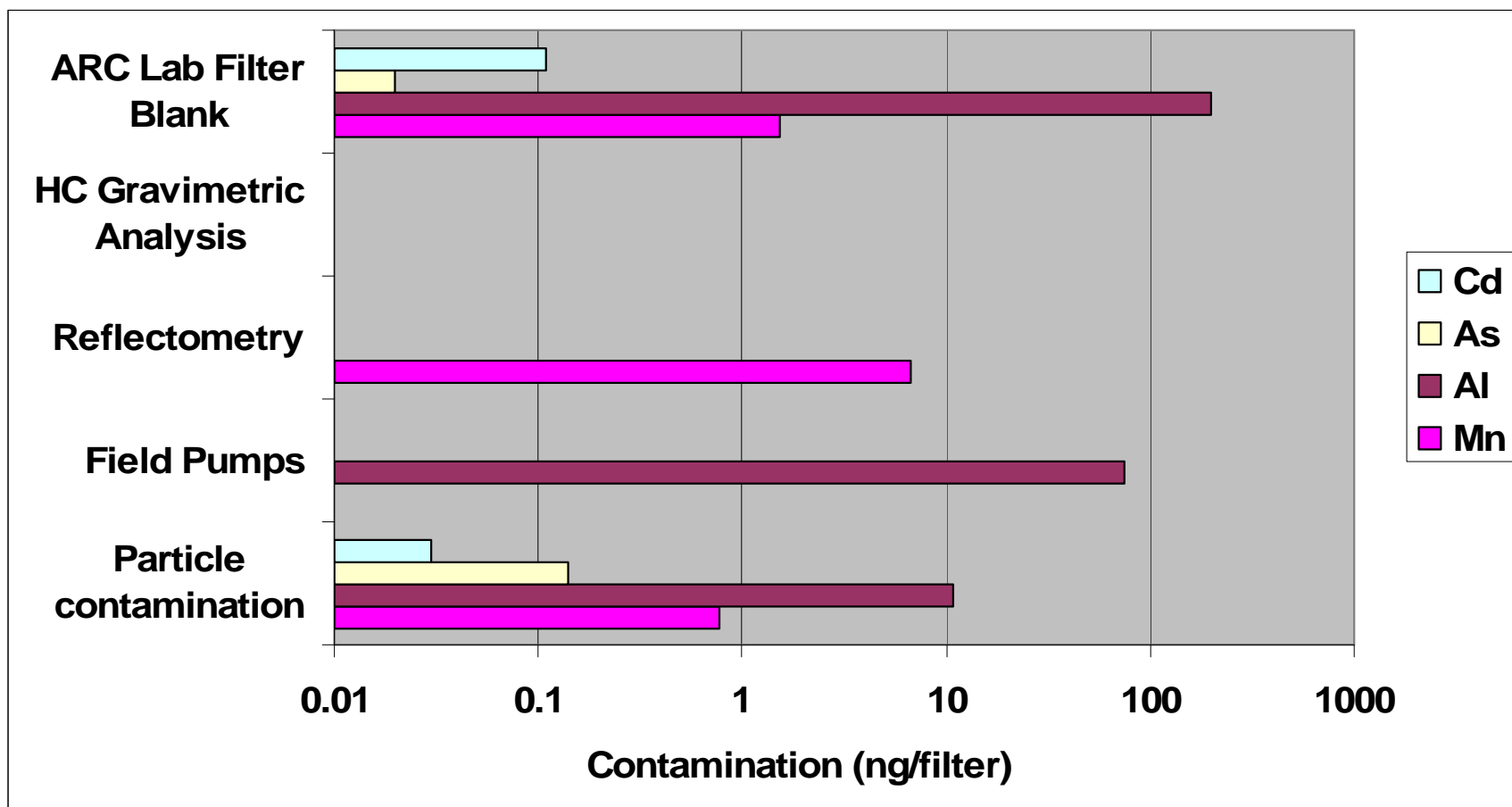
from Rasmussen et al. (2005)
15th Annual ISEA, Oct 31-Nov 4

Metals Introduced During Sampling, Handling and Processing





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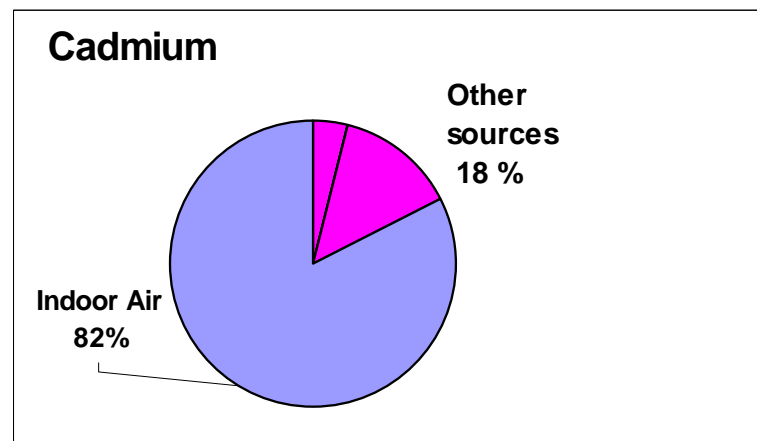
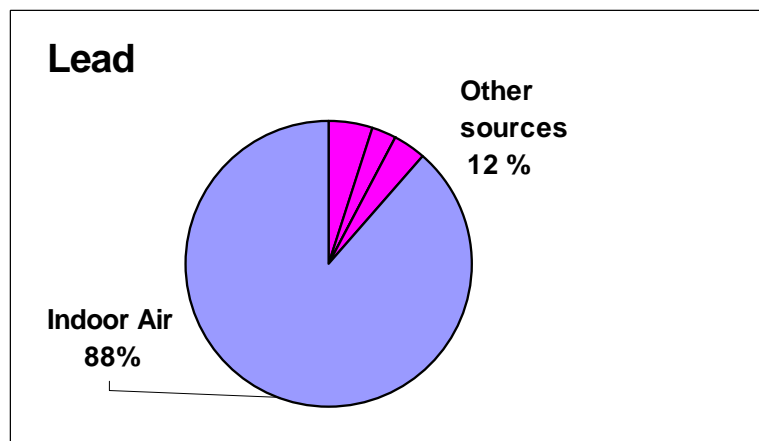
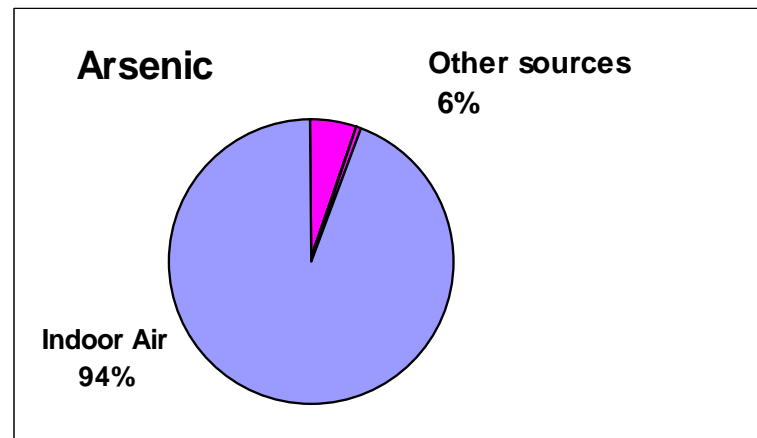
Metals Introduced During Sampling, Handling and Processing



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Indoor air samples: how much metal is contributed from contamination?

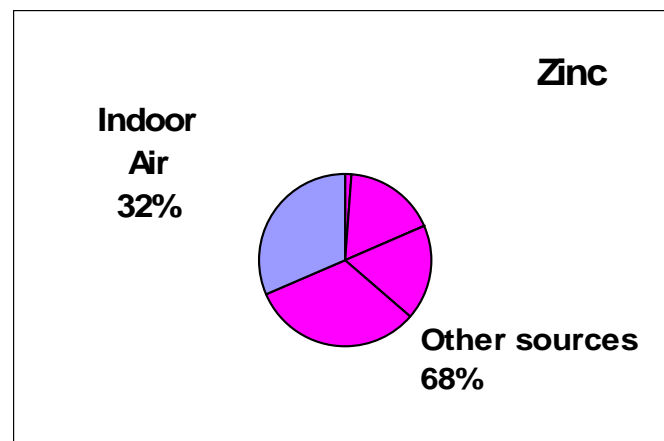
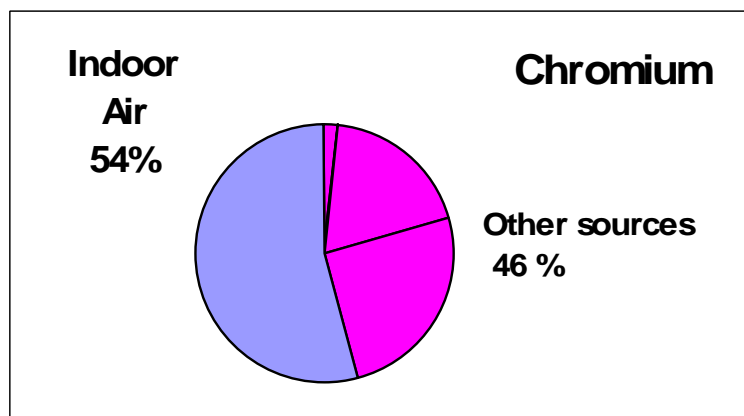
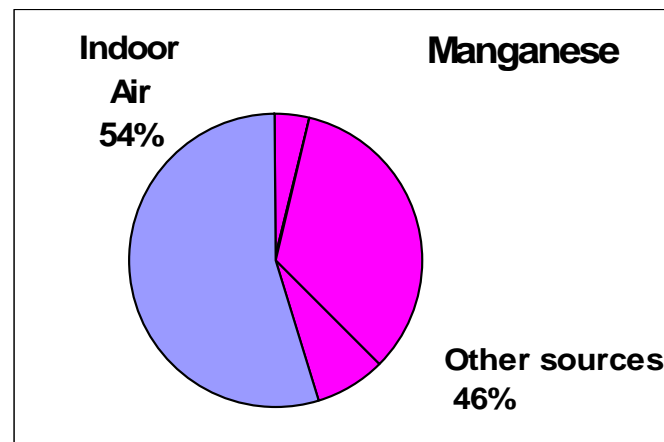
-  Metals in PM2.5 fraction of indoor air (what we want)
-  Metal contamination introduced during sampling, handling and analysis (what we don't want)



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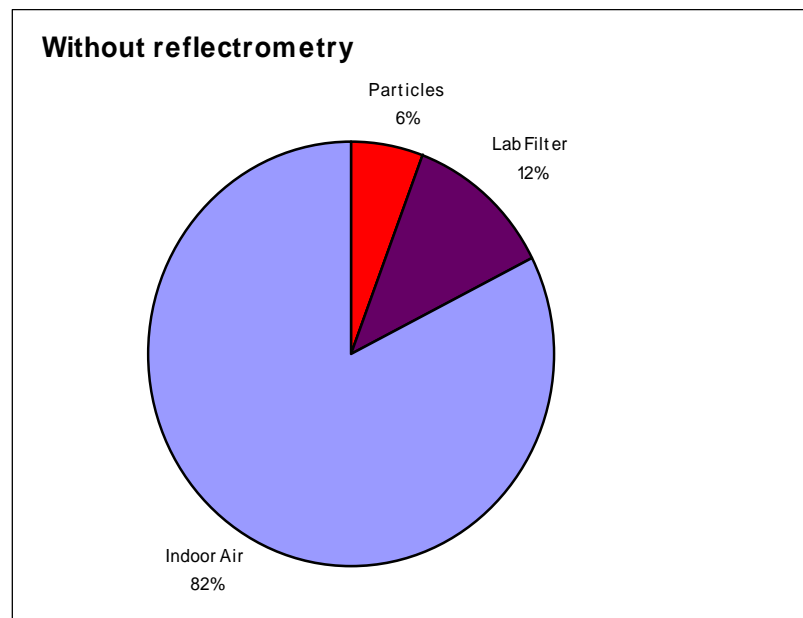
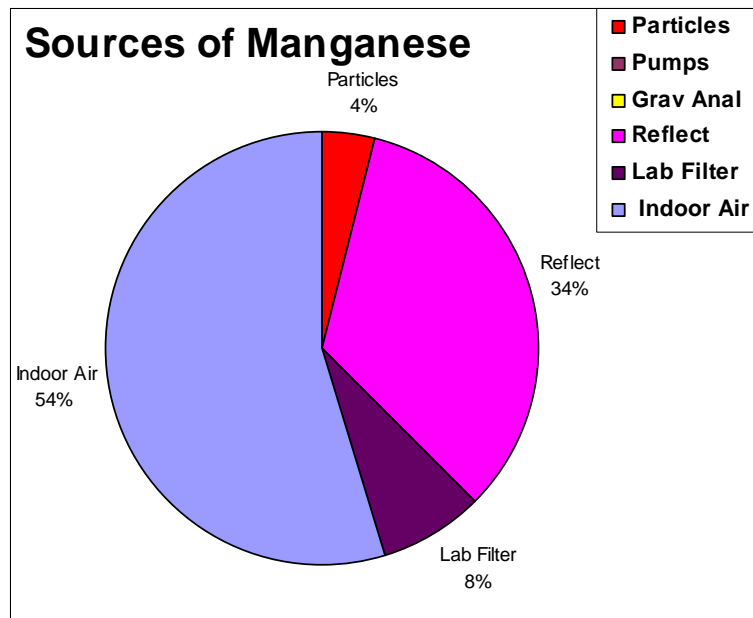
Indoor air samples: how much metal is contributed from contamination?

-  Metals in PM2.5 fraction of indoor air (what we want)
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Minimize the number of analytical steps – eliminate unnecessary handling



Reflectrometry step introduced Mn

Only 54% of Mn on the filter sample is from indoor air, the remainder is from inadvertent contamination

Eliminate reflectrometry ...

Now 82% of Mn on the filter is from indoor air, 18% is from inadvertent contamination

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Summary and Conclusions

- For 24-hr samples, contribution of metals from contamination during sampling, handling and analysis can easily exceed the contribution from PM_{2.5}
- Sources and magnitude of contamination differ from element to element.
- Do not subject the filters to multiple analyses - the risk of contamination outweighs the benefits.
- Load filters indoors inside a clean hood, wearing gloves. Never load filters outside the hood, or out-of-doors.
- Field blanks are essential to represent every process involved in handling, transport, and sampling (minus the actual pumping).
- The magnitude and variability of the field blanks will determine whether or not a given element should be reported.

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