

## Development of a carbonized wood passive sampler for atmospheric mercury

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### [Intro]

UNEP and WHO require reduce the amount used and mercury emission because it is a toxic metal. As a result, reduce and discharge in the world but Southeast Asia and China increase coal production and used by gold mining, And so increase emission to atmosphere. Emitted mercury to atmosphere is Hg<sup>0</sup> (elemental mercury) with over 95%. It can be transported and deposited to remote place from the sources because calculated atmospheric residence time of Hg<sup>0</sup> was estimated about 1 to 2 year. Furthermore deposited Hg can be converted to organic mercury and accumulated in the food chain, posing a potential threat to human's health. As a result, it is important to monitoring atmospheric mercury pollution. The present, atmospheric mercury sampler is active sampler with gold amalgam collection glass tube, but it is difficult to sampling cover wide area for high costs and need electrical power. So we made simple passive sampler for mercury monitoring with carbonized wood and experimented.

### [Method]

Sticked a wood (*c.japonica*) to acrylic laboratory dish with double-stick tape after it had been cut to 2.5cm×4.5cm×1.5cm and carbonized at 300 °C 2h in a electric muffle furnace. We conducted Uryu Exoerimental Forest of Hokkaido University, Sapporo campus of Hokkaido University, Kumagaya campus of Rissho University, Kuniiriyama in Gunma , Kanazawa University, Tottori University, Hiroshima University and Chiang Mai University (Thailand). Moreover, we compared the active sampler at Center for Environmental Science in Saitama.

### [Result]

Mercury concentration in propose passive sampler increased as day passed at All conducted sites. Mercury concentration in part of carbonized woods were 0.39 (for 33 days), 0.44 (for 66 days), 0.63 (for 95days), 0.86 (for 127 days), 0.91 ng Hg cm<sup>-2</sup> (for 158 days), and correlation coefficient was 0.95 at Center for Environmental Science in Saitama.

Atmospheric mercury concentration range were 2.0 to 2.6 ng Hg m<sup>-3</sup> during experiment. Absorption mercury speed into carbonized wood was uniform in steady atmospheric mercury. Propose passive sampler and active sampler were correlated, slope was  $y=14.7x$ , correlation coefficient was 0.95. Propose passive sampler was agreement with the data obtained by an active sampler by these results.

Keywords: mercury, carbonized wood, passivesamplerq, monitoring of air pollution