

**SND** Svensk Nationell Datatjänst



# **Characteristics of airborne gold aggregates generated by various methods: mass mobility characteristics and surface area**

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# Metadata Production

**Metadata** Swedish national data service

**Producer(s):**

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## Characteristics of airborne gold aggregates generated by various methods: mass mobility characteristics and surface area

*Karaktäristik av guldaggregat genererade med hjälp av olika metoder: massa mobilitet och ytarea*

### Overview

|                       |                                       |
|-----------------------|---------------------------------------|
| <b>Identification</b> | SND0966-001                           |
| <b>Version</b>        | Production Date2014-09-19<br>Original |

### Abstract

The performance of a new custom built spark discharge generator (SDGc) is investigated and compared to a commercially available spark discharge system (SDGp) and a high temperature evaporation furnace (HT) with regards to the output and characteristics of gold aggregates. The aerosols was characterized using a differential mobility-aerosol mass analyzer (DMA-APM) setup. Primary particle size and bridging was studied by Transmission electron microscopy (TEM) imagery and the aggregate mobility number size distribution determined using a Differential mobility particles sizer (DMPS). The total surface area is estimated using three approaches, and pros and cons of the approaches discussed. In the main method used to estimate the total surface area of individual aggregates over mobility size, the specific surface area according to TEM-image analysis is combined with the mass of the individual aggregates of a distribution, measured by the DMA-APM.

|                         |                   |
|-------------------------|-------------------|
| <b>Kind of Data</b>     | Experimental data |
| <b>Unit of Analysis</b> | Object            |

### Scope & Coverage

|                       |  |
|-----------------------|--|
| <b>Keywords</b>       | aerosol, nano aggregates, mass, mobility, DMA (Differential Mobility Analyzer), APM (Aerosol Particle Mass Analyzer) |
| <b>Time Period(s)</b> | 2010-10-01   |
| <b>Countries</b>      |  |

### Producers & Sponsors

|                                |   |
|--------------------------------|---|
| <b>Primary Investigator(s)</b> | Svensson, ChristianFaculty of Engineering, Lund University, Department of Design Sciences |
| <b>Other Producer(s)</b>       | Faculty of Engineering, Lund University, Department of Design Sciences                    |

### Data Collection

|                              |                                 |
|------------------------------|---------------------------------|
| <b>Data Collection Dates</b> | single 2011                     |
| <b>Time Period(s)</b>        | 2010-10-01<br>2011-01-01        |
| <b>Data Collection Mode</b>  | Physical measurements and tests |

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**Accessibility**

**Distributor(s)** Swedish National Data Service

## **File Description(s)**

**Dataset contains 1 file(s)**

**[[DataFileName]]**

## Variable Group(s)

Dataset contains 1 group(s)

### SND0966-001

| Name                      | Label   | Question |
|---------------------------|---|----------|
| SND_Studie                | SND_study 0964  | -        |
| SND_Dataset               | SND_dataset 0966-001                                  | -        |
| SND_version               | SND_version 1.0                                       | -        |
| Generator                 | Generator   | -        |
| SDGc                      | Spark discharge generator                             | -        |
| SDG 2,9                   | Spark discharge generator                             | -        |
| SDG 3,7                   | Spark discharge generator                             | -        |
| HT1575                    | High temperature evaporation/<br>condensation furnace | -        |
| HT1625                    | High temperature evaporation/<br>condensation furnace | -        |
| nm                        | Diameter  | -        |
| fg                        | Mass  | -        |
| X                         | Shape factor  | -        |
| Effd (g/cm <sup>3</sup> ) | Effective density                                     | -        |

## Variables Description

Dataset contains 13 variable(s)

**File :** [[DataFileName]]

**SND\_Studie:** SND\_study 0964

**Information:** Missing: \*

**SND\_Dataset:** SND\_dataset 0966-001

**Information:** Missing: \*

**SND\_version:** SND\_version 1.0

**Information:** Missing: \*

**Generator:** Generator

**Definition:** Type of generator producing airborne model nanoparticles

**Information:** Format: character, Missing: \*

**SDGc:** Spark discharge generator

**Definition:** New custom-built spark discharge generator, capable for nanoparticle production.

**Information:** Missing: \*

**SDG 2,9:** Spark discharge generator

**Definition:** Commercially available spark discharge generator, gas flow 2.9 l/min

**Information:** Missing: \*

**SDG 3,7:** Spark discharge generator

**Definition:** Commercially available spark discharge generator, gas flow 3.7 l/min

**Information:** Missing: \*

**HT1575:** High temperature evaporation/condensation furnace

**Definition:** High temperature evaporation/condensation furnace, gas flow 1.7 l/min. Furnace temperature 1575 °C.

**Information:** Missing: \*

**HT1625:** High temperature evaporation/condensation furnace

**Definition:** High temperature evaporation/condensation furnace, gas flow 1.7 l/min. Furnace temperature 1625 °C.



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**File : [[DataFileName]]**

**HT1625: High temperature evaporation/condensation furnace**

**Information:** Missing: \*

**nm: Diameter**

**Definition:** Diameter of particle. Measured in nanometre

**Information:** Type: continuous, Format: numeric, Missing: \*

**fg: Mass**

**Definition:** Mass of particle. Measured in femtogram

**Information:** Type: continuous, Format: numeric, Missing: \*

**X: Shape factor**

**Definition:** The ratio of Stokes' drag for the particle and a volume equivalent sphere

**Information:** Type: continuous, Format: numeric, Missing: \*

**Effd (g/cm3): Effective density**

**Definition:** Particle density based on the average particle mass and mobility volume. Measured in gram per cubic centimetre

**Information:** Type: continuous, Format: numeric, Missing: \*