**Supplemental Table 1: Forms of beryllium materials encountered during production and characteristics of exposure aerosols by the process or job area where the sample was obtained (adapted from Virji et al., Characteristics of Beryllium to Small Particles at a Beryllium Production Facility, *Annals of Occupational Hygiene*, 2011, 55(1), pp. 70–85, Oxford University Press)**. Since the samples were collected by process type and area, all of the samples do not correspond directly with jobs listed in Figure 1 and Tables 2-3.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Process or job area** | **Facility** | **Beryllium process materialsA** | |  | **Beryllium exposures** | |
|  | **Chemical Form** | **Physical form** |  | **Compound** | **SolubilityB** |
| **Beryllium Metal Production** |  |  |  |  |  |  |
| Wet Plant | A | Be(OH)2  (NH4)2BeF4 | Moist powder  Salt solution |  | Be(OH)2  (NH4)2BeF4 | Poor  SolubleD |
| Pebbles Plant Fluoride FurnaceC | A | (NH4)2BeF4 BeF2 | Salt solution Solid (glass) |  | (NH4)2BeF4  BeF2  BeO | SolubleD  SolubleD  Poor |
| Pebbles Plant Reduction FurnaceC | A | BeF2 Be | Solid (glass) Solid (pebbles) |  | BeF2  BeO | SolubleD  Poor |
| Powdering | A | Be | Chips/powder |  | Be | Poor |
| Machining (High Be) | A | Be  Be | Solid (parts)  Dissolved in MWF |  | Be  Be+2 | Poor  Soluble |
|  |  |  |  |  |  |  |
| **Beryllium Oxide Production** |  |  |  |  |  |  |
| BeO Screener | A | Be(OH)2  BeSO4·4H2O  BeO | Moist powder  Salt solution  Powder |  | Be(OH)2  BeSO4·4H2O  BeO | Poor  SolubleD  Poor |
| Oxide (Product) | A,B | BeO | Powder |  | BeO | Poor |
| Material Preparation | B | BeO | Powder |  | BeO | Poor |
| Pressing | B | BeO | Powder |  | BeO | Poor |
| Sintering | B | BeO | Powder |  | BeO | Poor |
| Machining | B | BeO | Powder |  | BeO | Poor |
|  |  |  |  |  |  |  |
| **Beryllium Alloy Production** |  |  |  |  |  |  |
| Master Alloy Arc Furnace | A | Be(OH)2  BeO CuBe | Moist powder  Powder  Molten/solid (ingot) |  | Be(OH)2 BeO  BeO | Poor  Poor  Poor |
| Casting Alloy Induction Furnace | A | CuBe | Solid (ingot) |  | BeO | Poor |
| Rod and Wire (Bulk Products) | A,C | CuBe  Be | Solid (rod/wire)  Dissolved in PS |  | Be  Be+2 | Poor  Soluble |
| Strip Operator (Product) | A,C,D | CuBe  Be | Solid (strip)  Dissolved in PS |  | Be  Be+2 | Poor  Soluble |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Miscellaneous Production** |  |  |  |  |  |  |
| Scrap Reclamation | A | Be  BeO  CuBe  BeF2 | Solid (various)  Solid (various)  Solid (various)  Salt solution |  | Be  BeO  Be  BeF2 | Poor  Poor  Poor  SolubleD |
| **Production Support** |  |  |  |  |  |  |
| R&D/QA and QC | A | Be  BeO  CuBe | Solid (various)/powder  Solid (various)/powder  Solid (various)/powder |  | Be  BeO  Be | Poor  Poor  Poor |

Be(OH)2 = beryllium hydroxide; (NH4)2BeF4 = ammonium beryllium fluoride; BeF2 = beryllium fluoride; Be = beryllium; Be+2 = dissolved/soluble beryllium; BeSO4·4H2O = beryllium sulfate tetrahydrate; CuBe = copper beryllium; MWF = metal working fluid; PS = pickling solution (acidic or caustic).

A White and Burke (1955); Stonehouse et al. (1992); Stonehouse and Emly (1992).

B Denotes compound solubility (lung and sweat) determined by Finch et al. (1988), Day et al. (2005), Stefaniak et al. (2006, 2011a, 2011b, 2012).

C These processes were not in operation at the time of data collection for this study.

D Inferred from chemical form.