

Ex session 1 – Solutions

Ex.1

- a) False
- b) False
- c) False

Ex.2

- a) True
- b) True
- c) False

Ex.3

- a) Neck BU, sheet BU, Disk BU
- b) Depends on the impact location of the collision

Ex.4

Time to reach 1mm radius: 4580 s

Ex.5

- a) Total number of ice crystals: $3 \cdot 10^{13}$
Mass of each crystal: 2 mg
- b) Rainfall produced: 6 mm

Ex.6

- a) Rainfall produced: 4 μm
- b) $\text{mass}_{\text{final}} = 10^3 \text{ mass}_{\text{initial}}$
- c) $\text{mass}_{\text{final}} = 1.95 \cdot 10^6 \text{ mass}_{\text{initial}}$

Ex.7

- a) False
- b) False
- c) False

Ex.8

- a) True
- b) True
- c) False
- d) False

Ex.9

- a) Because the supersaturation is larger with respect to ice than to liquid water, the ice crystal will experience larger vapor pressure gradients and will hence grow faster than the cloud droplet.
- b) In such conditions, the ice crystal will grow at the expense of the neighboring supercooled liquid water droplets (Wegener-Bergeron-Findeisen process, see detail on lecture slide 19)