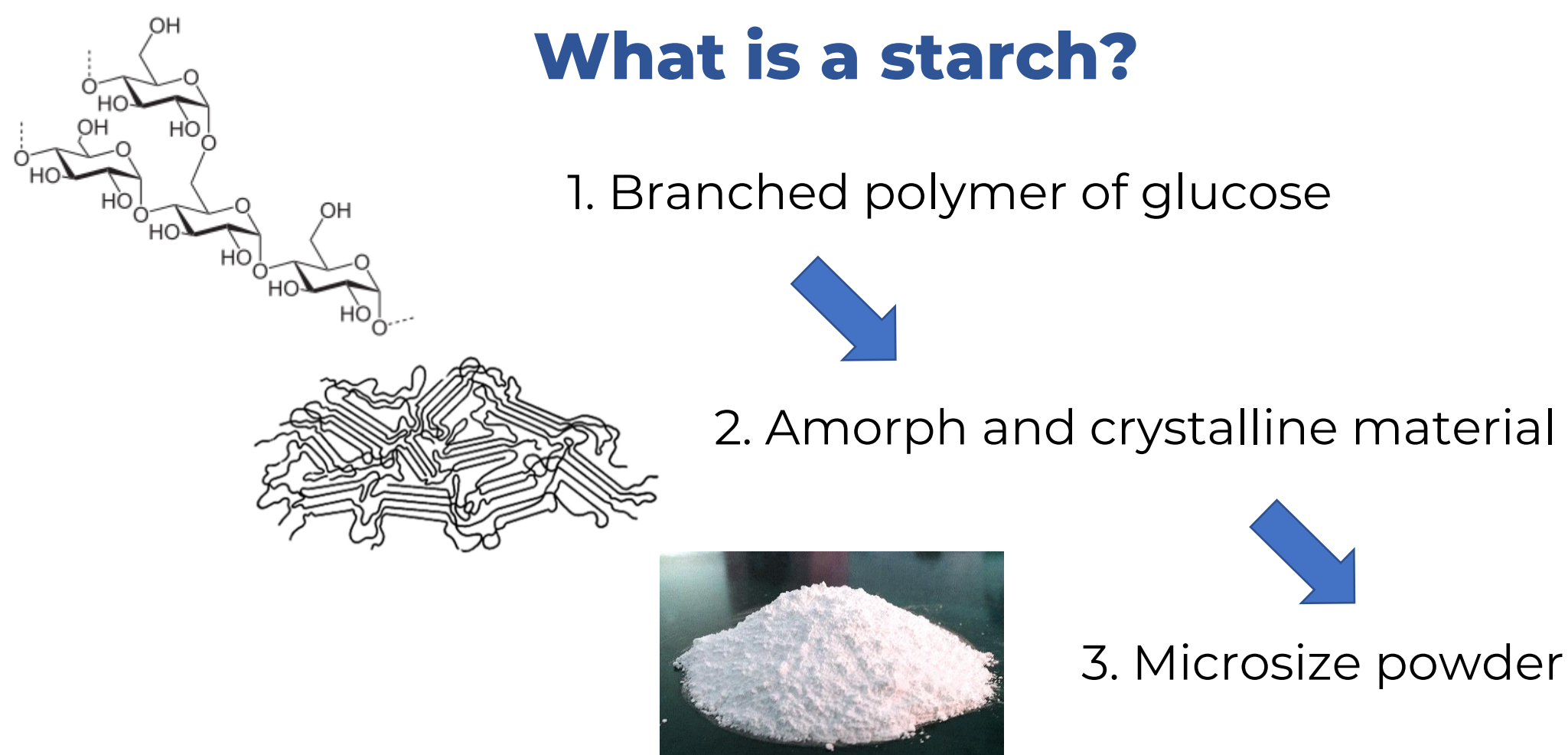
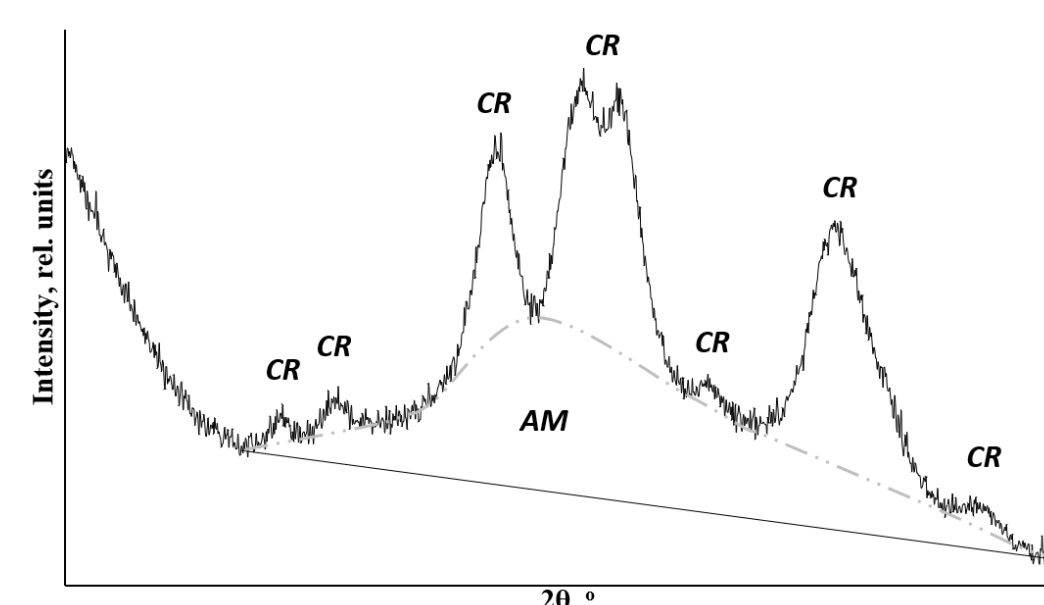


What is a starch?



Crystallinity of starch:



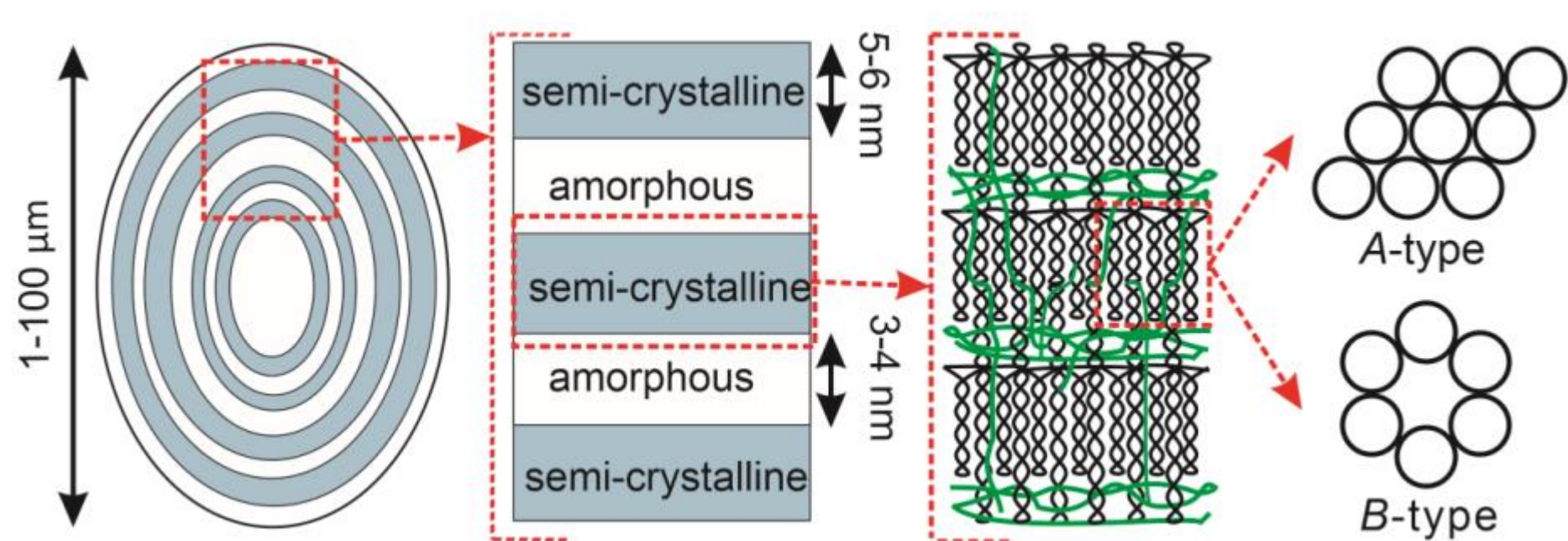
$$CI = \frac{S_{cr}}{S_{total}} * 100\%$$

- S_{cr} - area of crystalline phase
- S_{total} - total area

CR – the crystalline phase
AM – the amorphous phase

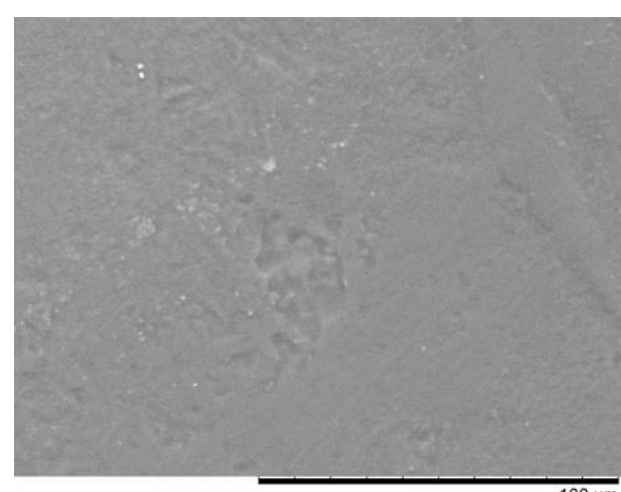
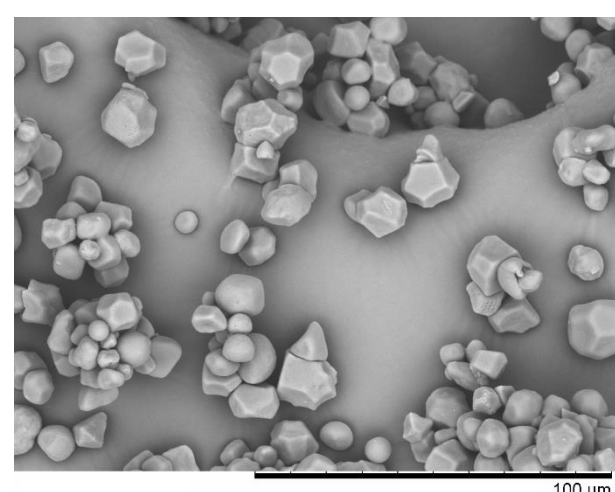
Podgorbunskikh E.M., Health, Food & Biotechnology. 2022;4(1)

Tree types of starch:

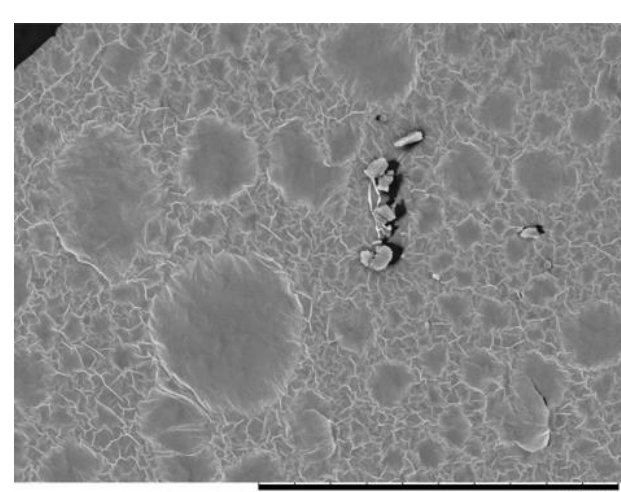
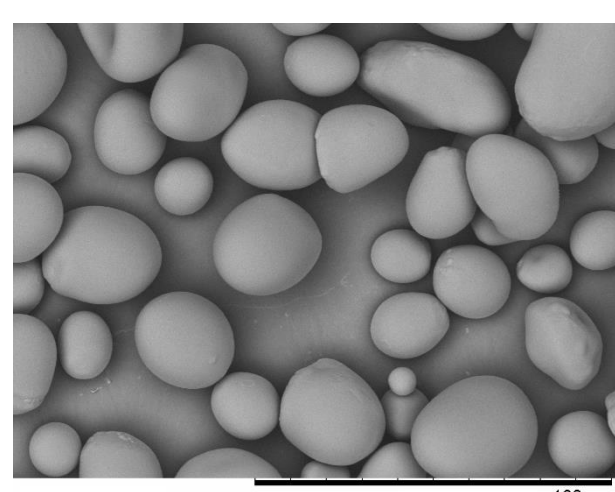


Dome, K. Polymers 2020, 12, 641

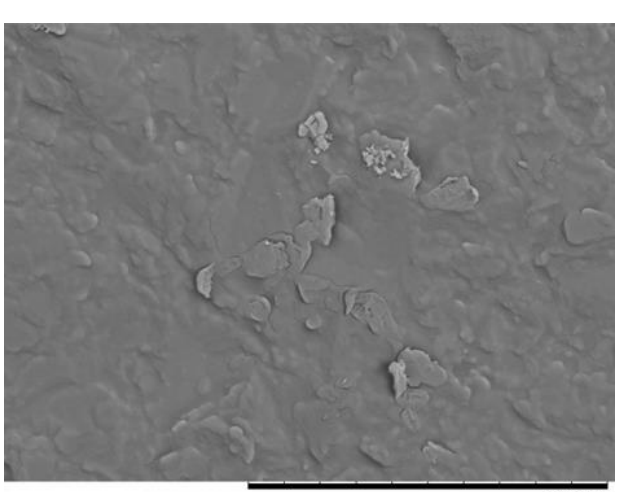
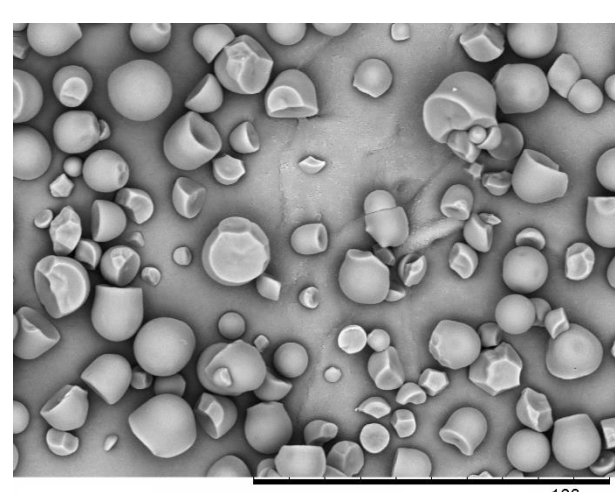
- A – type: Corn starch



- B – type: Potato starch

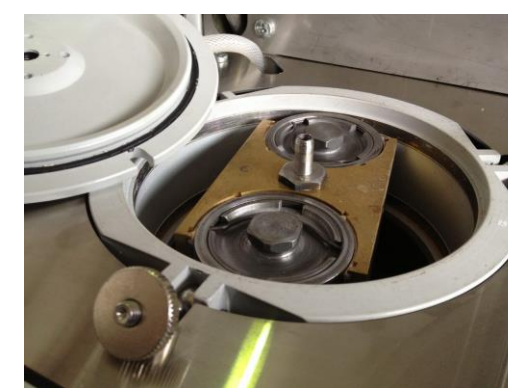


- C – type: Tapioca starch

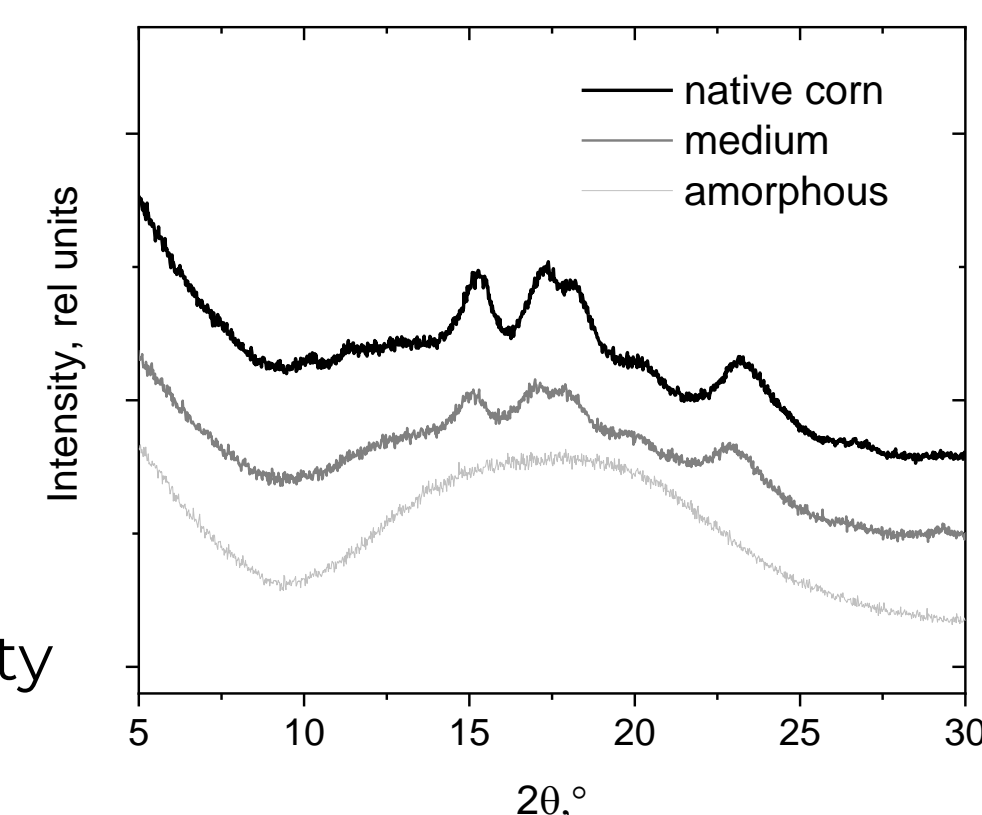


Amorphization

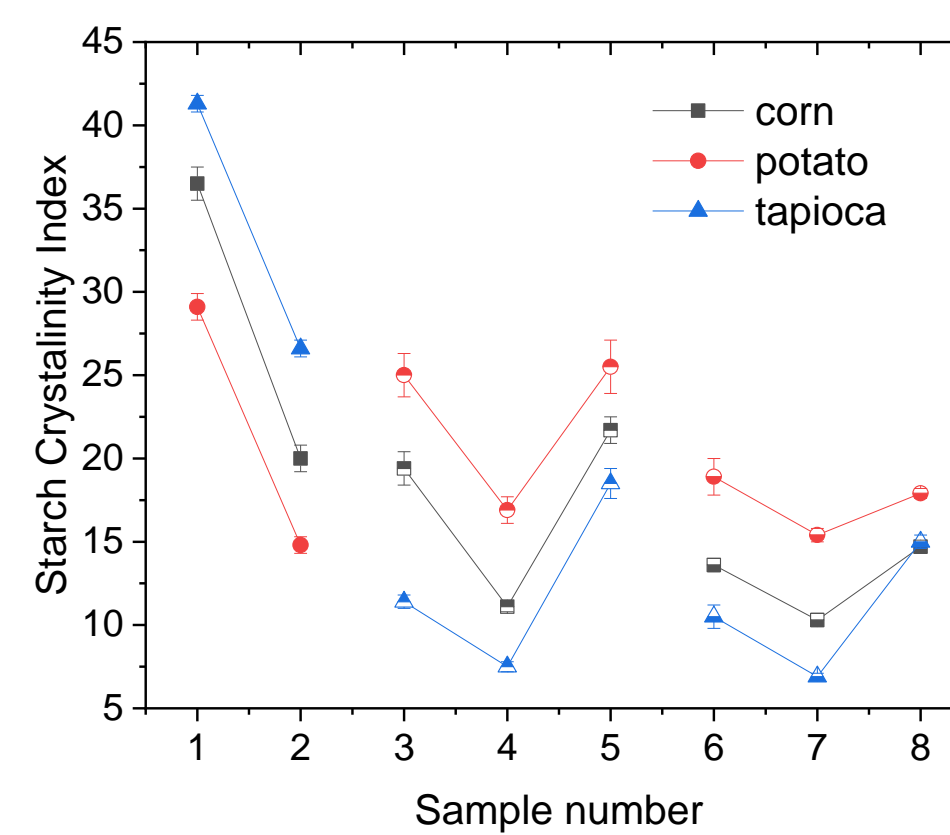
Planetary ball mill AGO-2



- 0.5 min: medium crystallinity
- 10 min: full amorphous



Re-crystallization



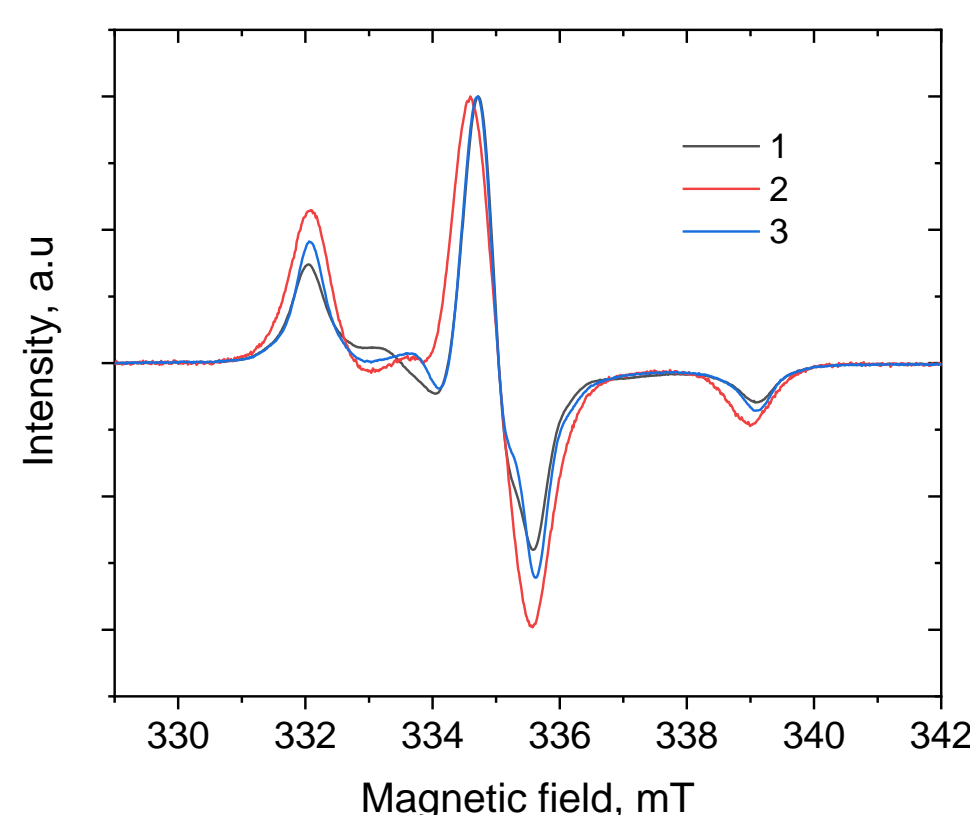
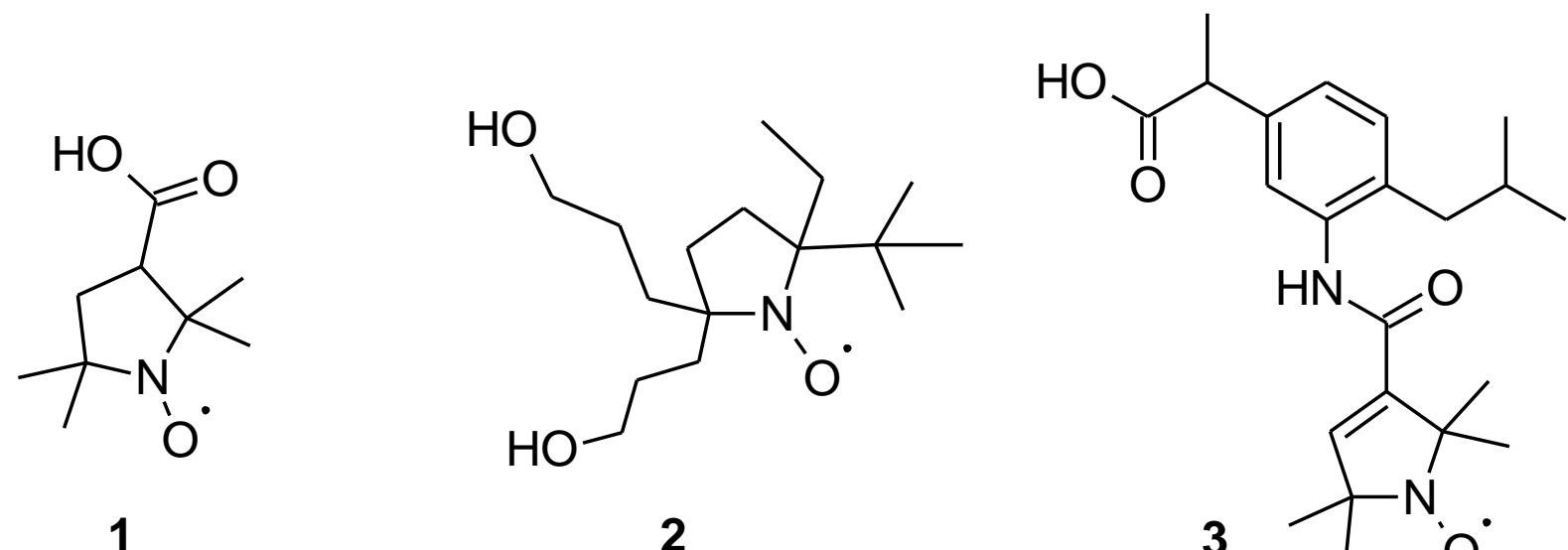
Powder samples:

1. before mill
 2. after mill (medium)
- Films:
3. from native starch
 4. from milled starch
 5. from amorphous starch
 6. as 3 with Proxyl
 7. as 4 with Proxyl
 8. as 5 with Proxyl



- “well done” amorphous starch re-crystallized in films
- B and C-type changes its places of crystallinity degree
- Addition of spin label slightly decrease of crystallinity

EPR experiment: corn-starch films



Mobility of spin label sensitive to its size

Conclusion:

- ABC starch classification correlates with properties of starch films
- EPR has potential to characterization of them

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