2022 SEAISI Steel Mega Event & Expo

The Influence of Annealing Parameters on Microstructures in Low Carbon Steels

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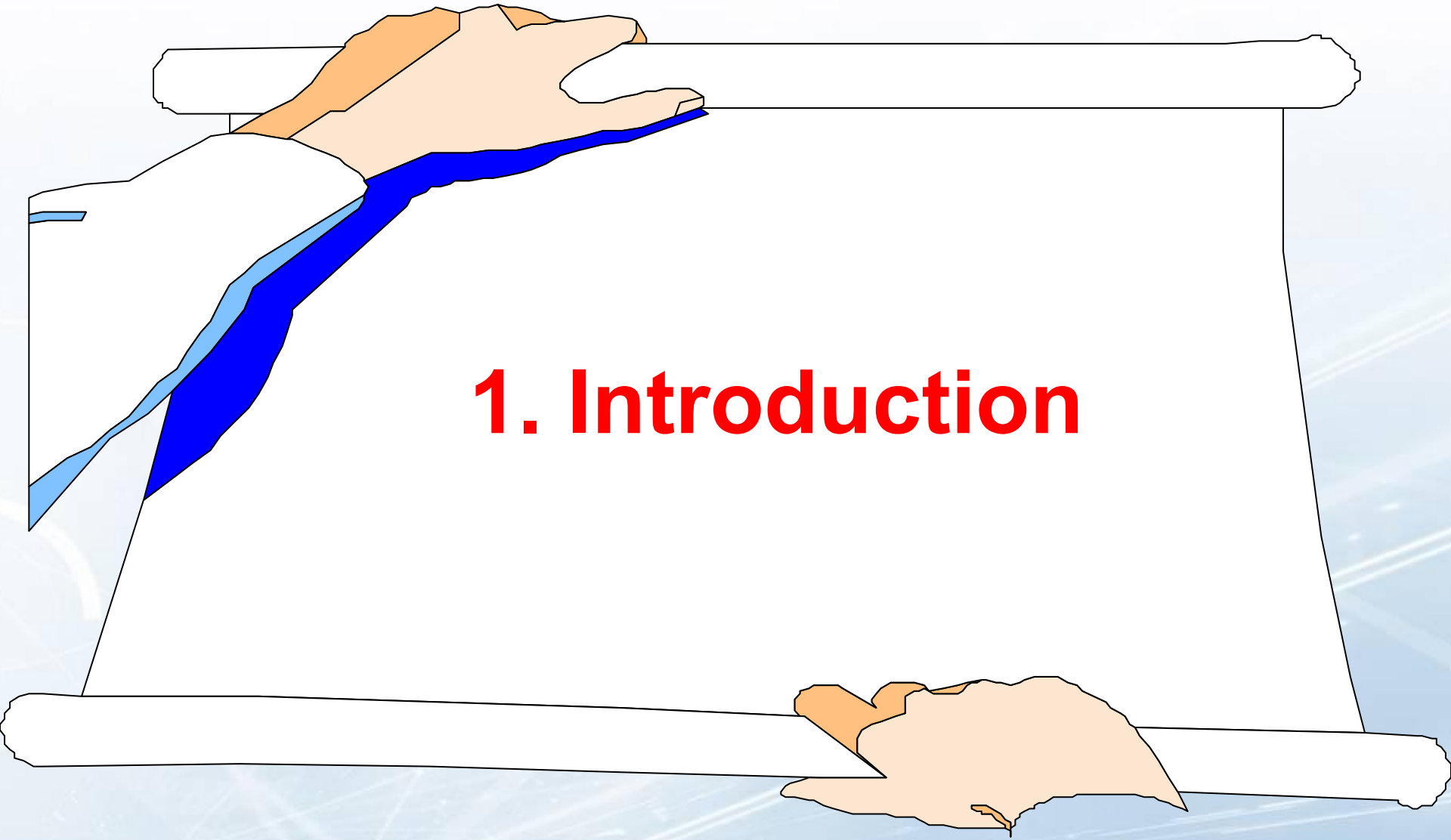
OUTLINE

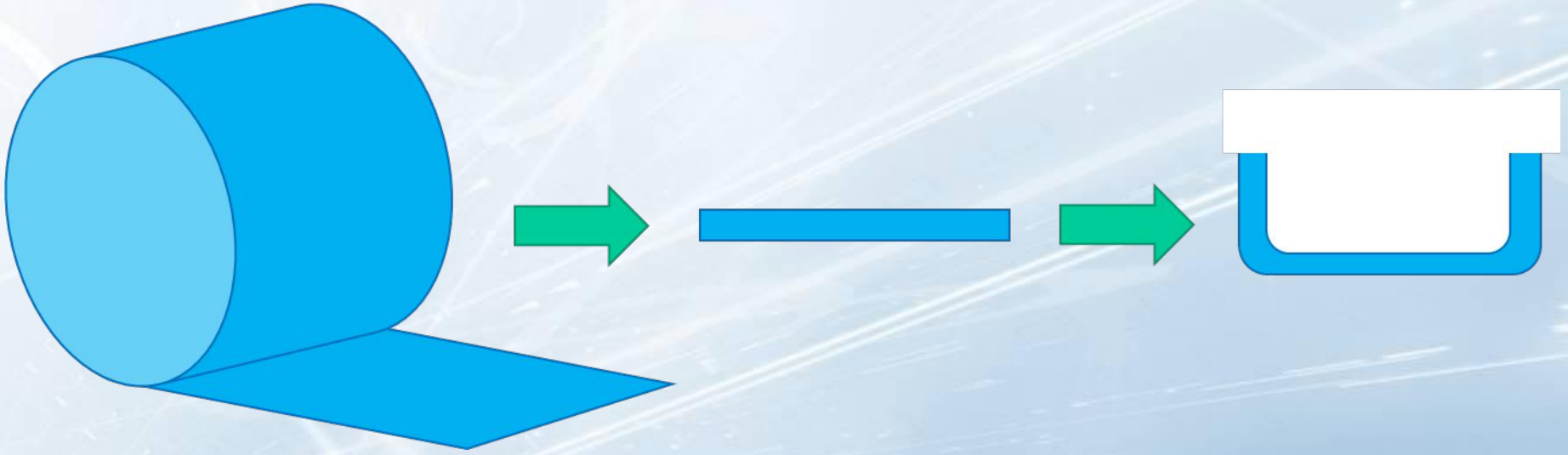
- Introduction
- Experiment
- Results and Discussion
- Conclusions



1. Introduction

Introduction

- Hot-rolled band product for hub of wheel
- Formability
- Conduction of annealing treatment

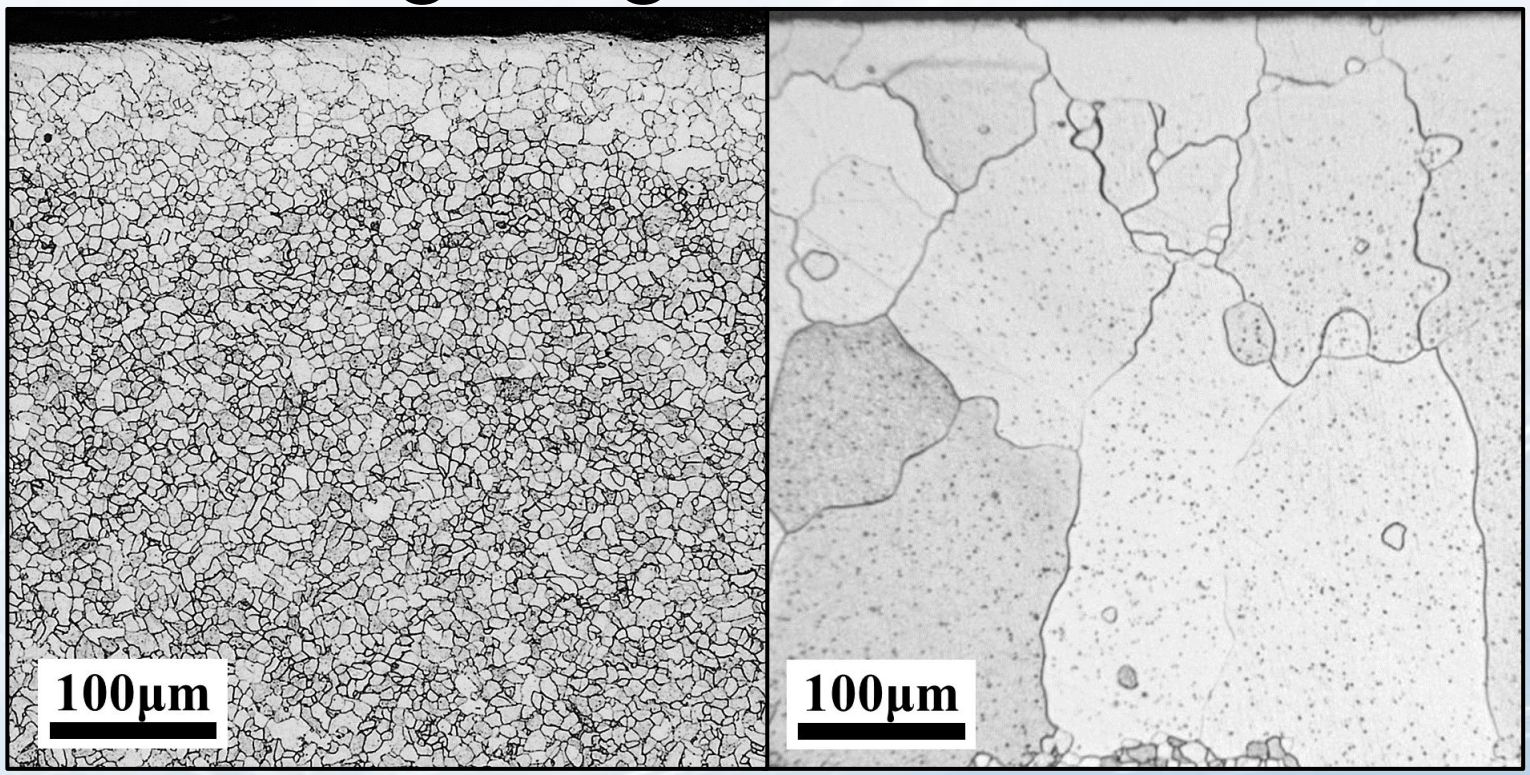


Introduction

- SAE 1010, Fe-0.1C-0.45Mn (wt%)
- Annealing treatment was conducted
  not enough □ too hard
  decent □ shperoidized structures
  over □ abnormal grain growth

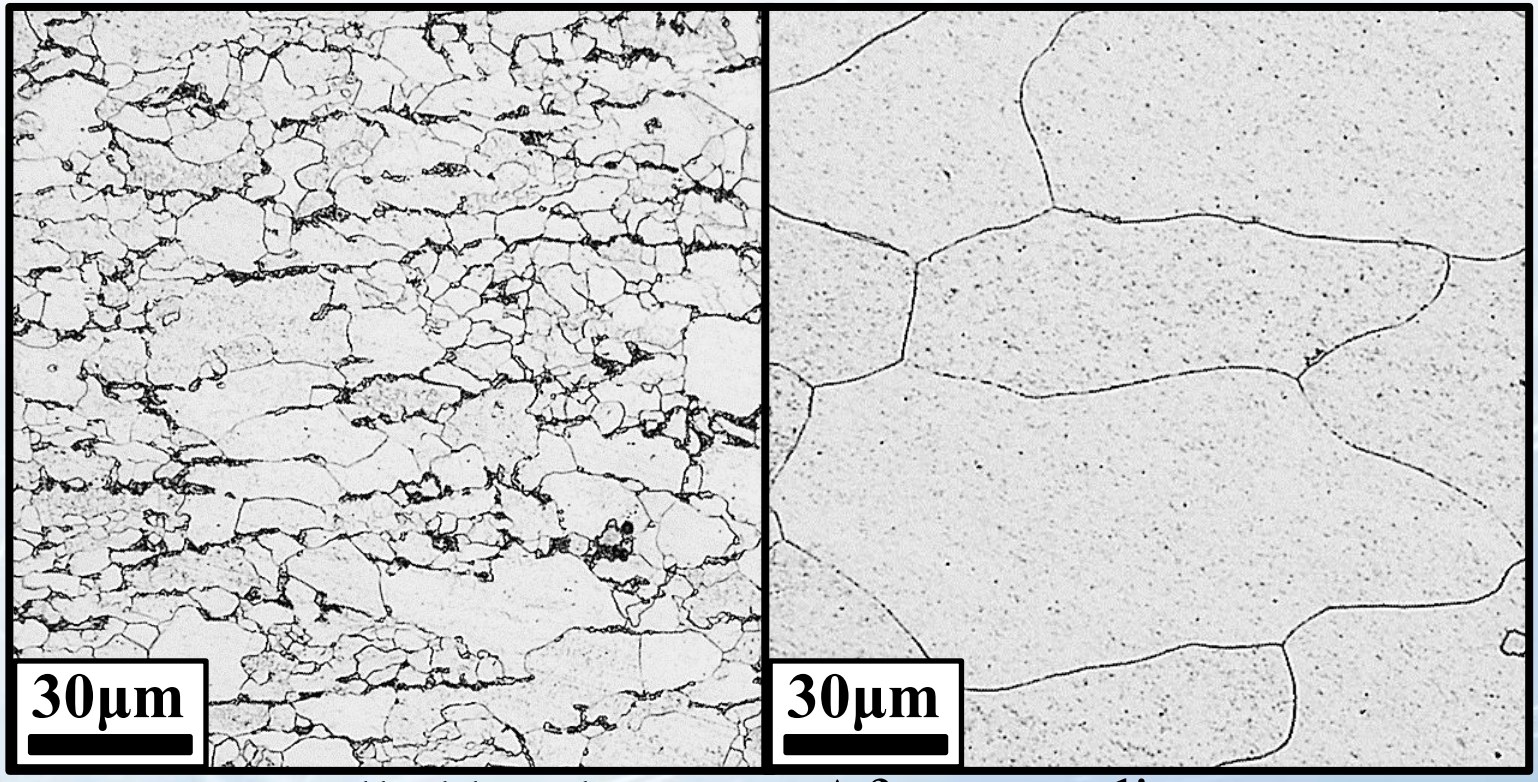
Introduction

- Abnormal grain growth



Introduction

- The microstructures near the surface

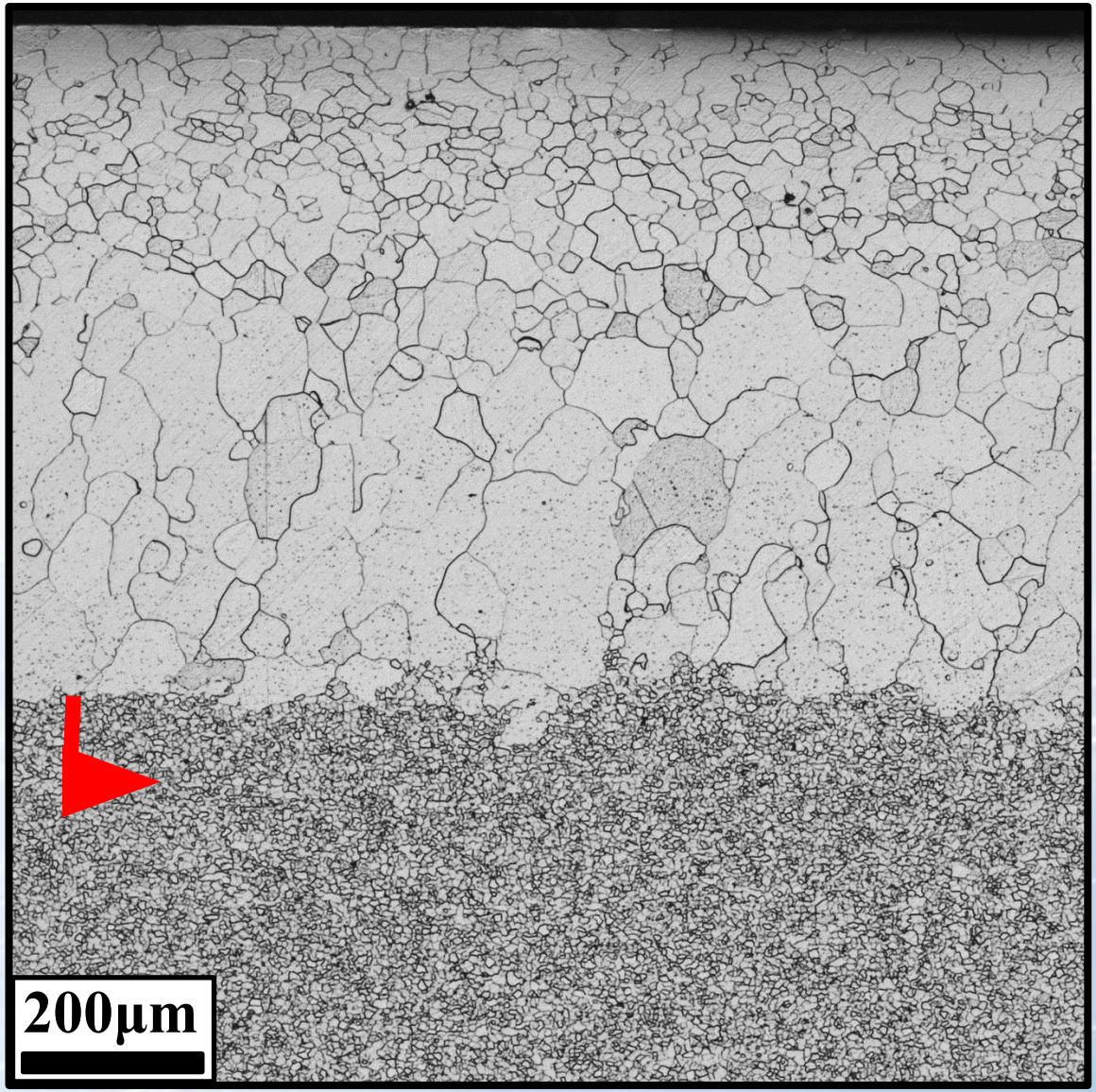


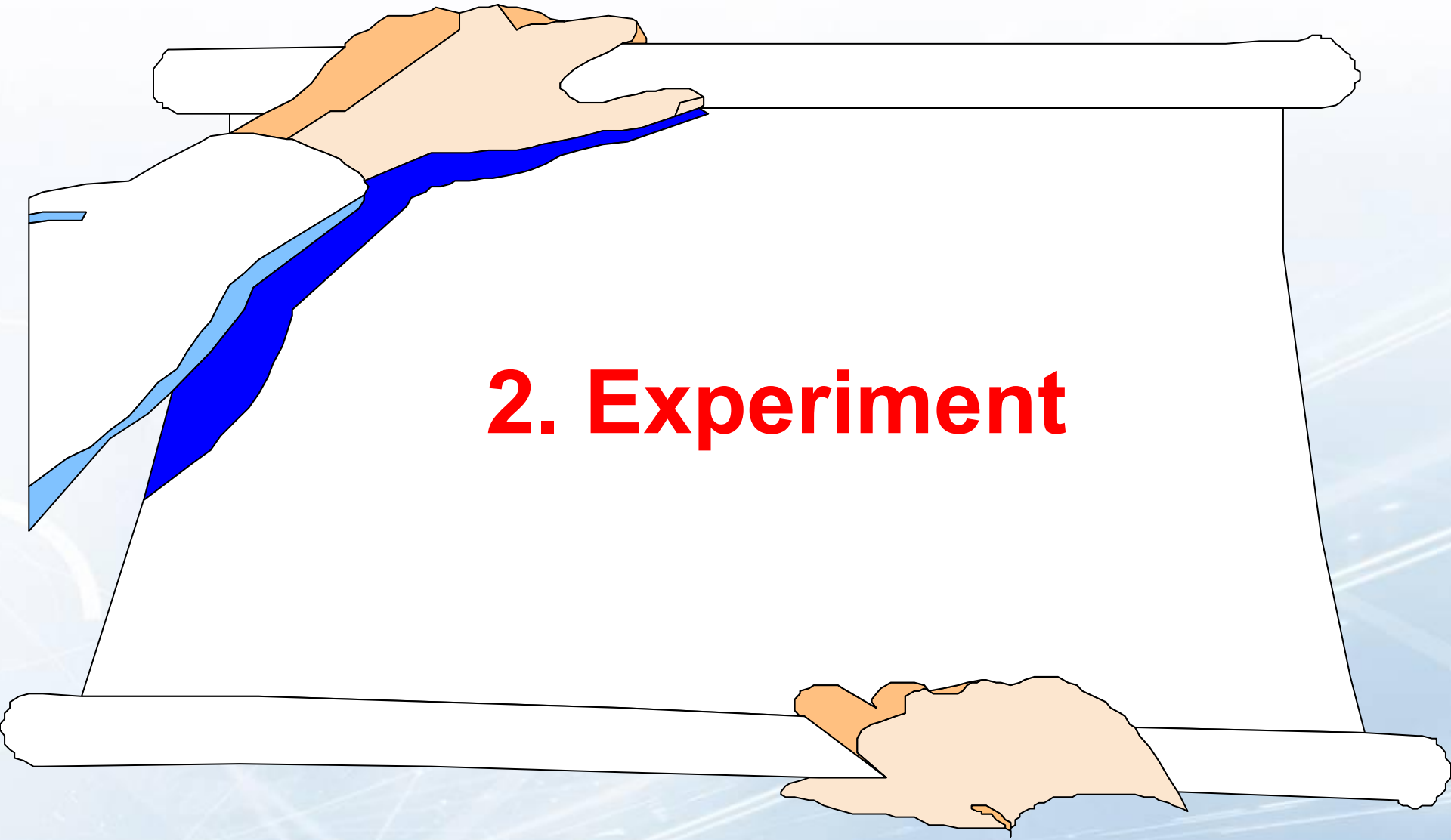
Hot-rolled band

After annealing treatment

Big grains competed with one another

Big grains grew along the thickness direction

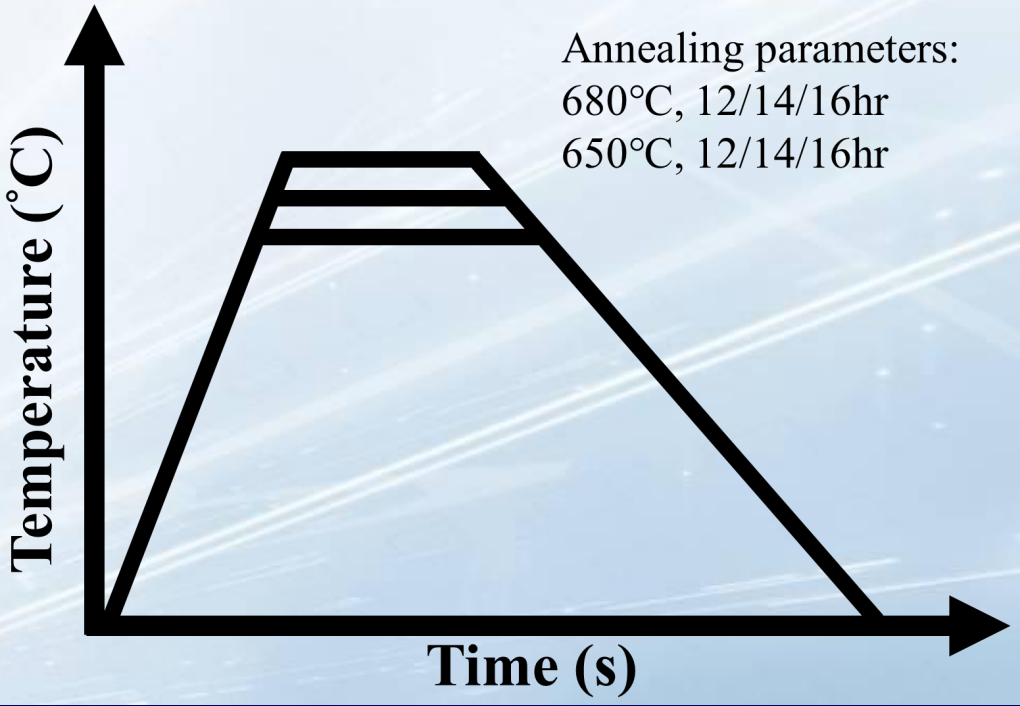


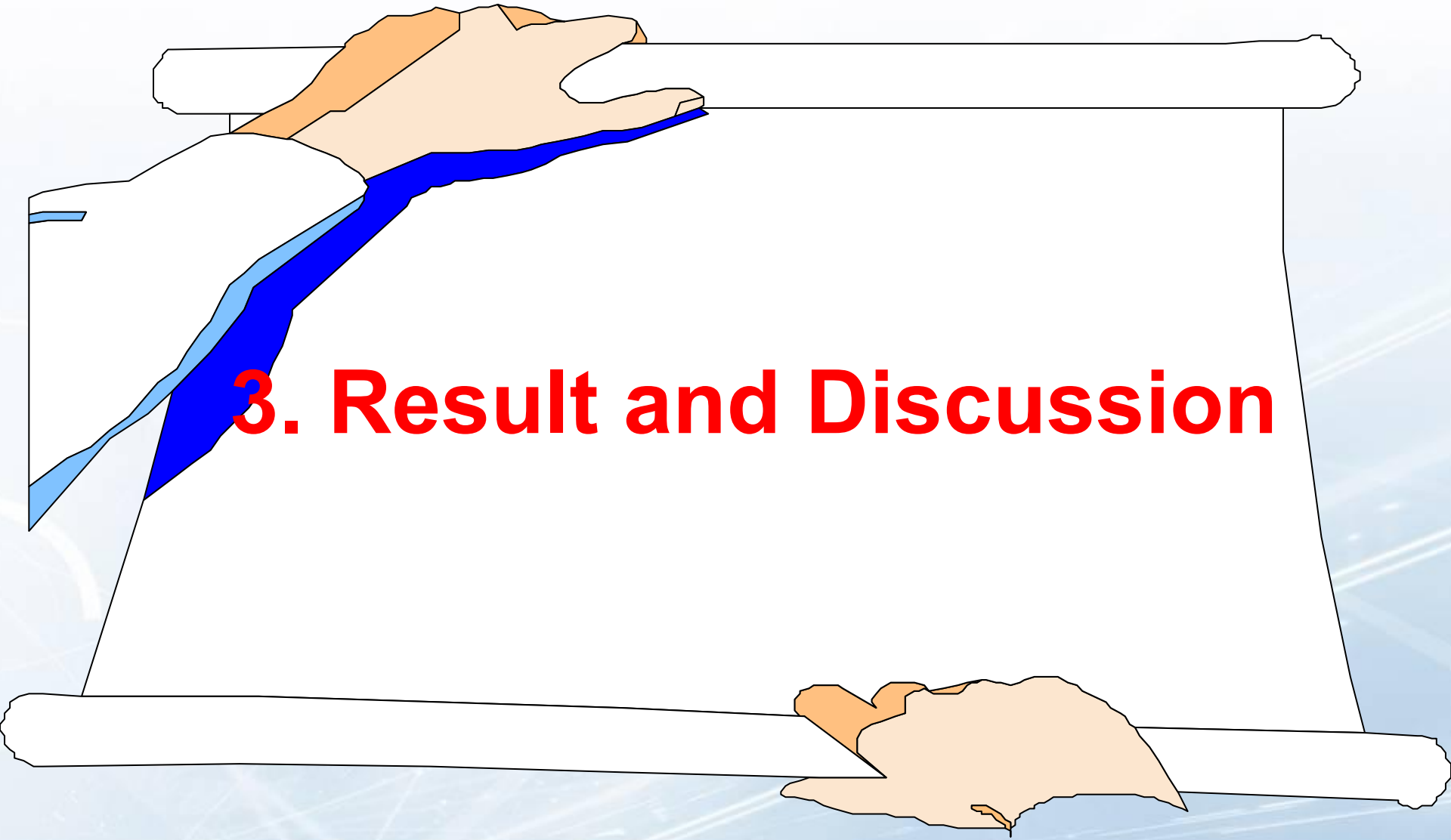


2. Experiment

Experiment

- Goal: spheroidized structures without abnormal grain growth
- OM & SEM observation
- Hardness

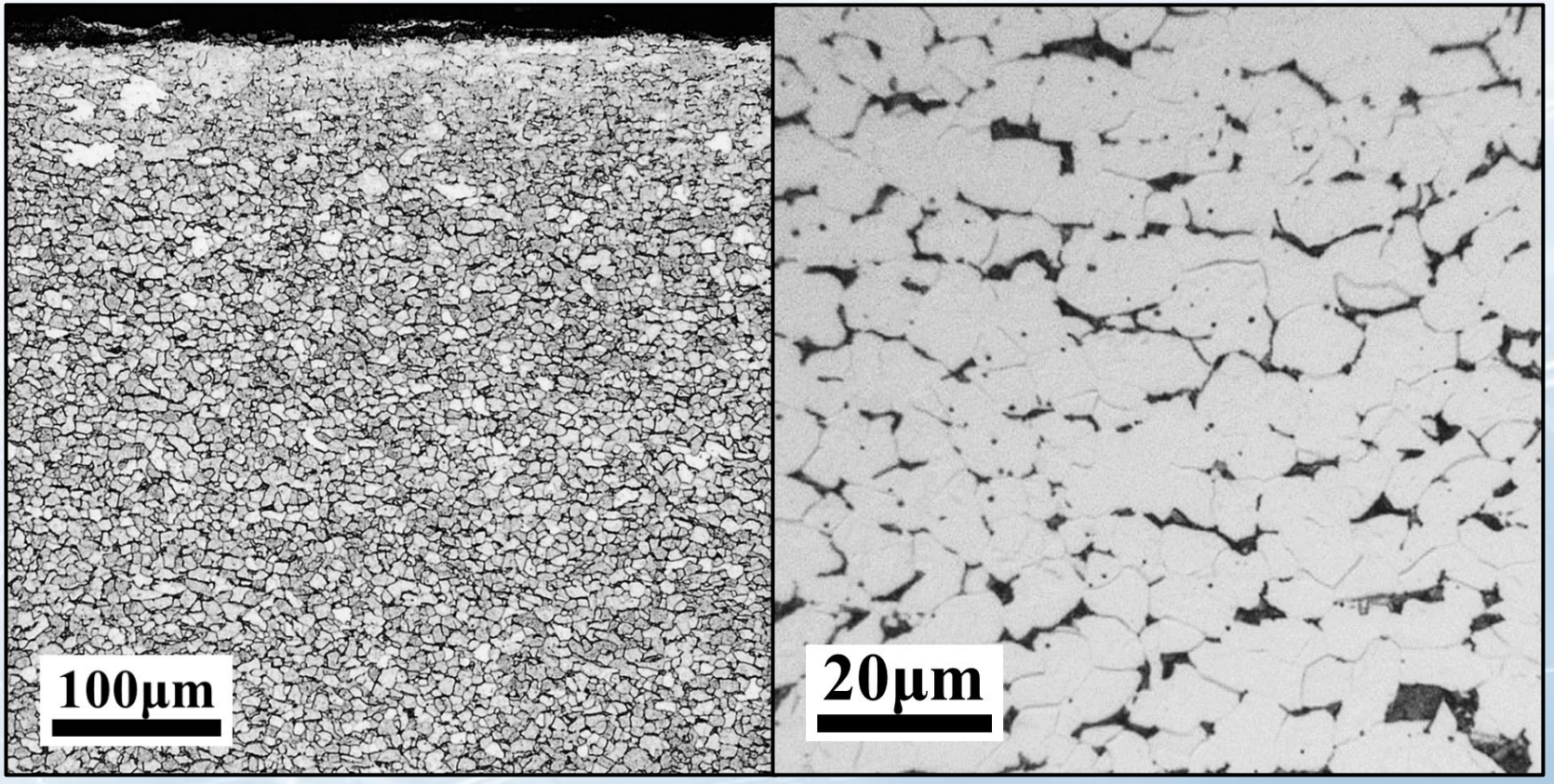




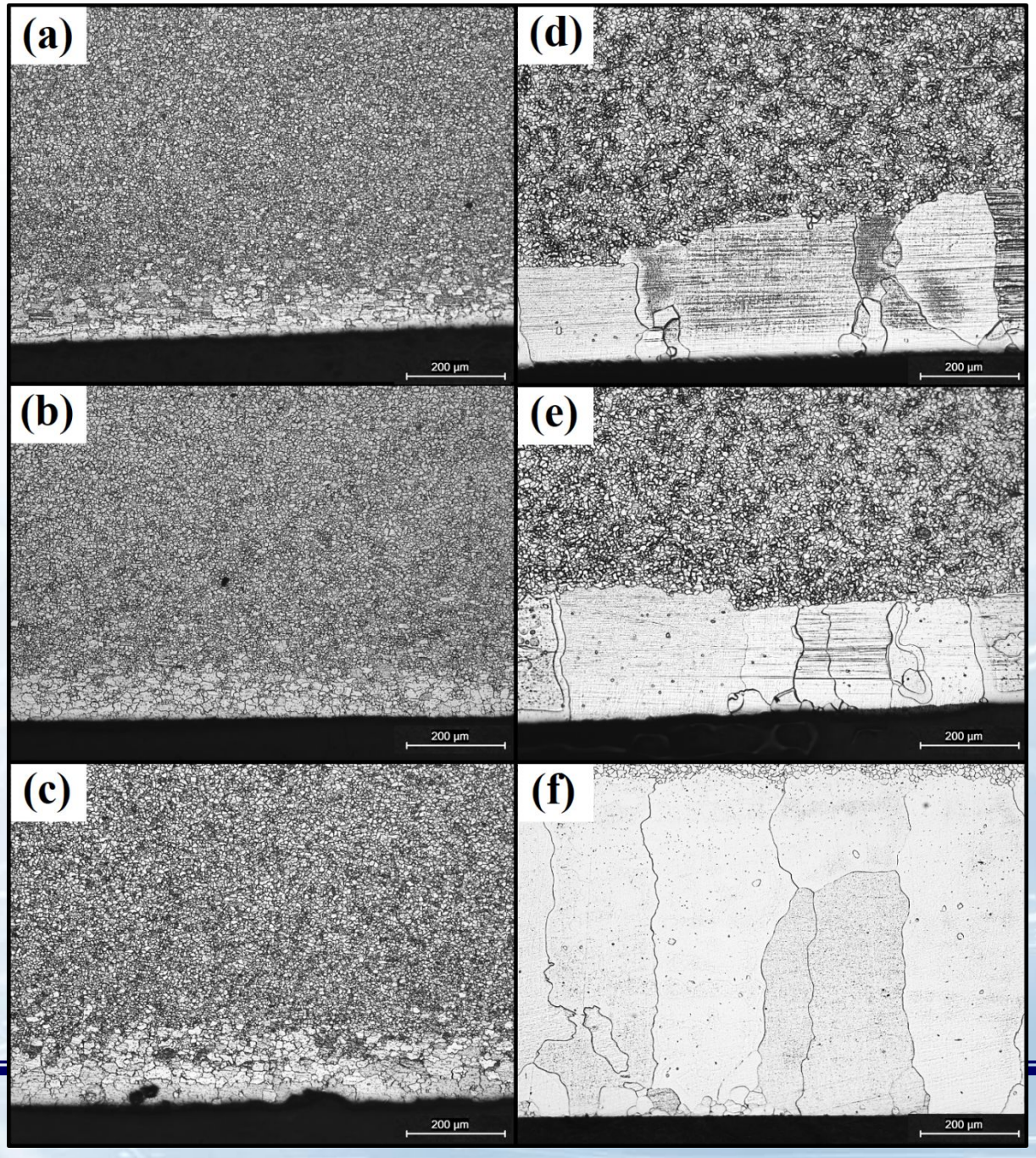
3. Result and Discussion

Result and Discussion

- Microstructures of hot-rolled bands

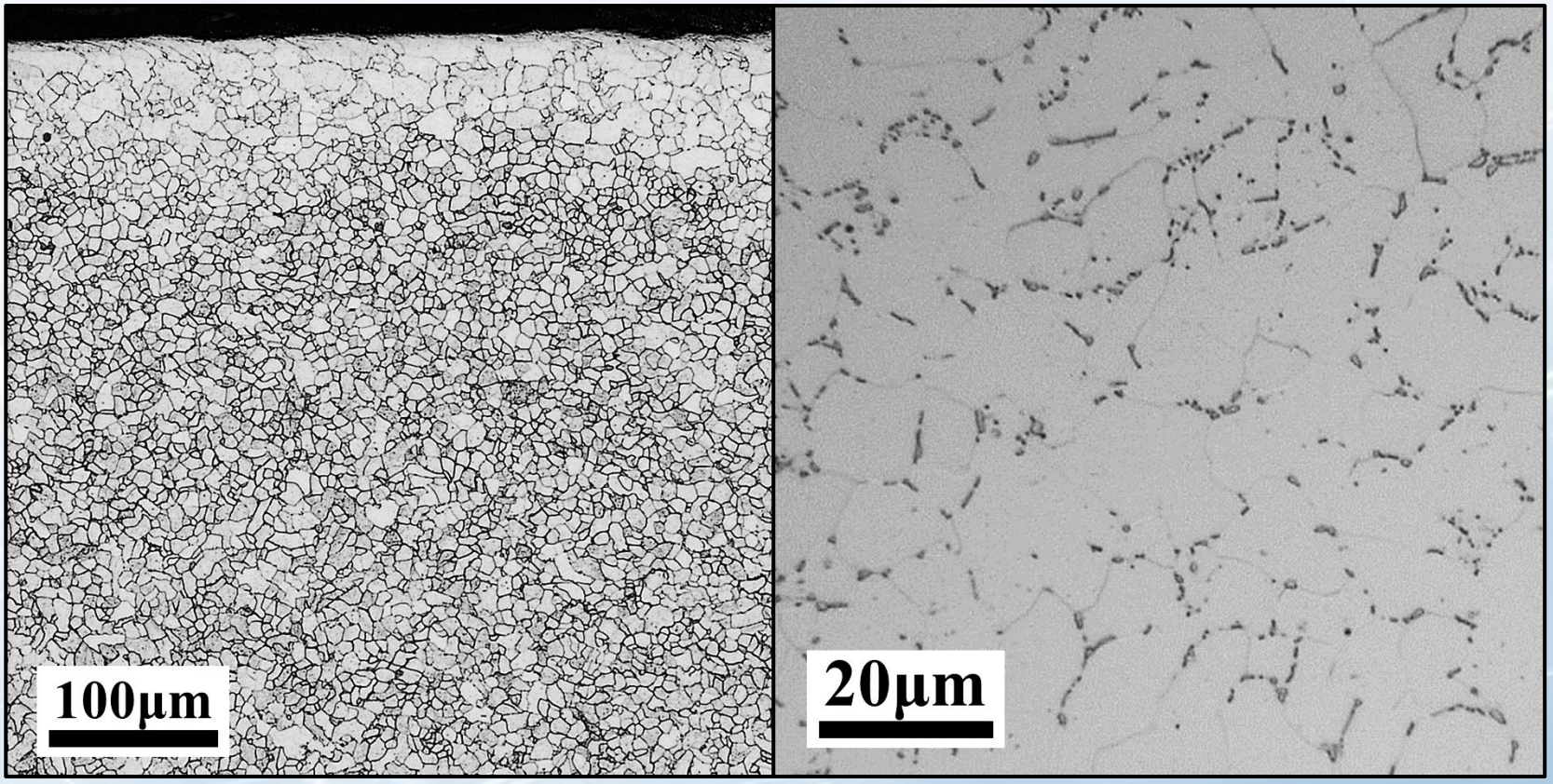


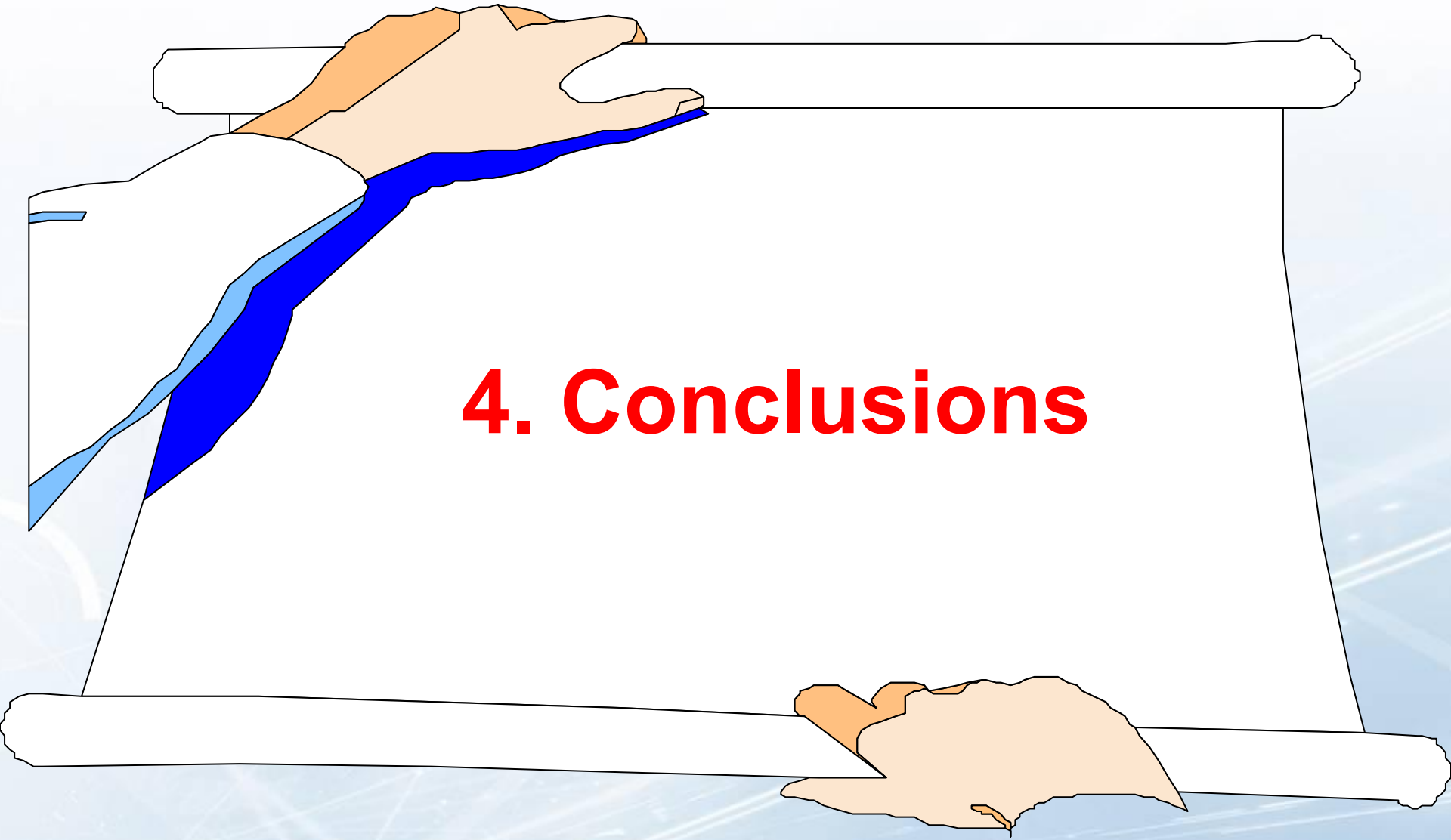
650℃ 12hr	680℃ 12hr
650℃ 14hr	680℃ 14hr
650℃ 16hr	680℃ 16hr



Result and Discussion

- New annealing parameters





4. Conclusions

Conclusions

- Annealing treatment could soften materials, but the abnormal grain growth sometimes occurred at high temperature.
- After several annealing experiment, the annealing treatment with 650℃/12hr was chosen.

Thank You