

Introduction to Carbon Capture and Storage

(이산화탄소 포집 및 저장 개론) (38535-01)

- 2019 Midterm Examination -

Student ID:

Name:

Notice

Fill your name below:

*"I, _____, swear I solve all problems by myself in this midterm examination.
I will take any disadvantages if any dishonesty such as cheating is acted on my solution."*
5 points will be deducted from your total score if you do not fill in your name above.

Problem 1.

Give the full name for each abbreviation:

- 1-1. CCS [2 pts.]
- 1-2. IPCC [2 pts.]
- 1-3. IEA [2 pts.]
- 1-4. BAU [2 pts.]
- 1-5. UNFCCC [2 pts.]

Problem 2.

- 2-1. Draw a phase diagram of pure CO₂ with its critical point. [4 pts.]
- 2-2. How much are critical pressure and temperature of pure CO₂? [4 pts.]
- 2-3. What is dense phase? [4 pts.]
- 2-4. What is a supercritical fluid? [4 pts.]
- 2-5. What happens to the phase diagram if impurities are added to the pure CO₂? [4 pts.]

Problem 3.

Address six options that are conventionally considered geological CO₂ storage formations. Explain each option up to three sentences, in brief. [15 pts.]

Problem 4.

4-1. Draw a graph to compare four trapping mechanisms of CO₂ in terms of time since cessation of injection (years) and trapping contribution (%) [10 pts.].

4-2. Explain how residual gas saturation is controlled by pore geometry [10 pts.].

Problem 5.

Describe a closed loop of a modeling process under geological uncertainty using more than or equal to 30 terms. You MUST number all the terms from ①, ②, ③, Note that 0.5 points per term is given to you. 15 points are the maximum you can earn from this problem. [15 pts.].

Problem 6.

Explain the following terms, in brief:

6-1. Effective porosity [3 pts.]

6-2. Permeability [3 pts.]

6-3. Intraformational seal [3 pts.]

6-4. Rate seal [3 pts.]

6-5. Drainage and Imbibition [3 pts.]

6-6. Buoyancy force [5 pts.]

----- This is the End of the Midterm Examination -----