Carboxylic acids: structures and formation

Teacher / technician

YEAR 11 / LESSON 99 / CHEMISTRY ONLY

Staff preparation and answer guidance. Keep separate from student sheets. Written and model-based lesson; no laboratory procedure is implied.

Coverage and delivery

Chemistry only: 4.34C–4.35C and 4.31C. Structure and equation workshop; no oxidant handling.

Allow about 60 minutes. Follow the student sequence and use the answers to check reasoning.

Requisition • class of 30, working in 15 pairs

Item	Per pair / setup	Class total
Booklet / writing tools	1 per learner	30 sets
Model kit / periodic table	1 set per pair	15 sets

Immediate safety

Desk activity only; keep small model pieces away from mouths.

Preparation and delivery

Read alongside the student method

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1. Provide 30 booklets and 15 model kits or reusable atom counters; no chemicals are needed.

2. Use 10 minutes retrieval, 25 independent/pair tasks, 15 explanation and 10 corrections. Keep first attempts visible.

3. Include the carboxyl carbon in naming; check carbon valency four and oxygen valency two.

4. No chemical oxidation demonstration is included; use only written reference equations.

5. Check all carbon valencies, formula subscripts and equation coefficients. Label any supplied numbers as practice data, not class observations.

Close of lesson

- Return shared equipment and retain corrected reasoning.

Check before teaching

Check the cards, reference data and quantities against this requisition. Keep the staff answer guide separate until the checking stage. Supplied numerical practice datasets are labelled examples; they are not class measurements.

Answers and teaching notes

Expected explanations • do not give as experimental observations

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- Methanoic acid.
- CH_3CH_2COOH.
- Four; butanoic acid.
- –C(=O)–OH, with carbonyl O double-bonded and hydroxyl O single-bonded.
- $C_2H_5OH + 2[O] \rightarrow CH_3COOH + H_2O$.
- The hydroxyl is attached to a carbonyl carbon as part of a carboxyl group, giving different chemical behaviour.

References and provenance

Pearson Chemistry specification

Prepared 22 November 2026. Original wording, tables and questions. Sources inform the concepts and technique; the lesson scope and classroom quantities are explicitly described here. No laboratory trial or final school risk approval is claimed.