# 高等学校化学基礎「物質量」の学習における実験教材の開発

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Development of experimental teaching materials for the study of basic chemistry “Amount of substance” in high school([1]*Graduate School of Education, Tokyo Gakugei University*, [2]*Tokyo Gakugei University*) ○Fumiya Nakamura,[1] Akira Ikuo,[2]

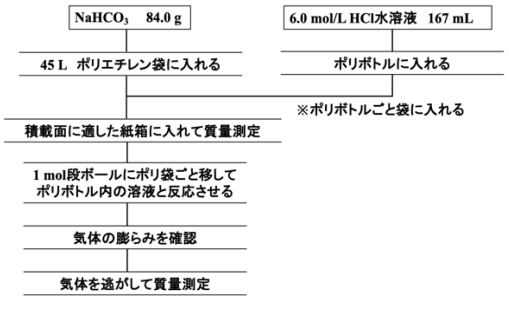
In the study of basic chemistry “Amount of substance” in high school, students are expected to understand the relationship between the mole, a unit of amount of substance, and three units: the number of particles, mass, and volume of gas. On the other hand, it is difficult to understand the relationship between the mole and the three units if the concept of the relationship between the mole and the three units is not constructed. Therefore, we developed and practiced teaching materials that link moles and each unit with the aim of realizing the usefulness of the amount of substance.

The experiment was conducted to generate 1 mol of carbon dioxide by reacting 1 mol of sodium bicarbonate with 1 mol of hydrochloric acid in a plastic bag(flowchart), based on a previous study[1)]. The reaction was carried out in a 22.4 L cardboard box with the units marked on the side to emphasize the connection between the mole and each unit (picture). A questionnaire survey was conducted after the practice, and significantly positive evaluations were obtained regarding this material.

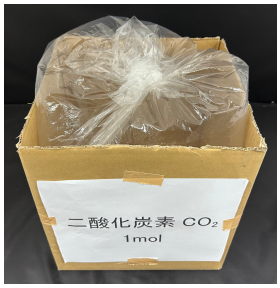
*Keywords : Development of teaching materials; Amount of substance; Volume ; Unit weight*

高等学校化学基礎「物質量」の学習では物質量の単位であるモルと粒子数、質量、気体の体積の３つの単位との関係性を理解することが目指されている。一方、モルと３つの単位の関係性の概念が構築されないと理解するのが困難である。そこで、物質量の有用性の実感を目指しモルと各単位を結びつける教材開発を行い実践を行った。

実験内容は先行研究[1)]参考にポリ袋内で 1 mol の炭酸水素ナトリウムと 1 mol の塩酸を反応させ 1 mol の二酸化炭素を発生させる実験を行った（フローチャート）。反応させる際に、22.4 L サイズに作成した段ボール内で行い、側面に単位を記すことでモルと各単位との結びつきを強調した(写真)。実践後に質問紙調査を行い、本教材に関して有意に肯定的な評価を得た。




フローチャート




反応の様子

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