

Abstract Submitted
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Development of a new ^{48}Ca enrichment method and the CANDLES experiment TADAFUMI KISHIMOTO, Osaka University — CANDLES is a project to study double beta decay of ^{48}Ca . CANDLES could become the most competitive experiment if we could have an efficient method to enrich ^{48}Ca . We developed a new method for enrichment of large amount of calcium isotopes. The method is called Multi-Channel Counter-Current Electrophoresis (MCCCE) which can be found elsewhere.¹ Essential point is the increase of the power density in the migration path. In MCCCE, ions migrate in multi-channels on a boron nitride (BN) plate by which substantial increase of the power density was achieved. We made a tiny prototype instrument with a 10 mm thick BN plate and obtained 3 for an enrichment factor for the ratio of abundance of ^{48}Ca to ^{43}Ca over that of natural abundance. It corresponds to 6 for the enrichment factor of ^{48}Ca to ^{40}Ca . Recently we obtained 10 for the enrichment factor by using 20 mm BN plate. This remarkably large enrichment factor demonstrates that the MCCCE is a realistic and promising method for the enrichment of large amount of ions. This method can be applied to many other elements and compounds. I will describe MCCCE and its effect on the study of double beta decay and other fields.

¹T. Kishimoto et al., PTEP (2015) 033D03; doi:10.1093/ptep/ptv020

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