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授与した学位	博士
専攻分野の名称	学術
学位授与番号	博甲第5564号
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学位授与の要件	自然科学研究科 地球惑星物質科学専攻 (学位規則第4条第1項該当)
学位論文の題目	Geochemical and Geochronological Study of the Cenozoic Adakitic Lavas from SW Japan: Implications for the Slab-Mantle Interactions in a Hot Subduction System (西南日本の新生代アダカイトの地球化学的および年代学的研究:若く温かい沈み込み帯におけるスラブ・マントル相互作用)
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## 学位論文内容の要旨

### Chapter 1: Introduction

This chapter presents an introduction to the characteristics of an active continental margin and the main aspects of an island arc. Secondly, the significance, importance, related problems with this terminology and the current level of understanding of adakites. Finally, the incentive for and objectives of this study.

### Chapter 2: Cenozoic South-Western Japan Hot Subduction

This chapter provides a description of the regional tectonic and volcanic history of SW Japan, describing the different magmatic episodes and the main tectonic events occurred in this area. Secondly, describes the current characteristics of this subduction system and finally emphasize the proposed models for the genesis of adakites in SW Japan.

### Chapter 3: Sample locality and SW Adakites Geology

This chapter explains in detail the local geological features of the adakitic sampled from the volcanic fields in SW Japan, and provides detailed locations of samples.

### Chapter 4: Analytical procedures

This chapter contains the details of each analytical technique employed to obtain the data presented in this study.

### Chapter 5: Results

This chapter shows analytical results on samples obtained in the course of this study, including petrographic features, geochronology and geochemistry (major elemental abundance, trace elemental abundance, and bulk isotopic compositions) of the adakites.

### Chapter 6: Discussion

This chapter discusses chronological, petrological, and geochemical features of adakites in SW Japan. Second, the processes responsible for magmatic evolution are discussed. Third, the sources of adakite magmas are discussed based on the mass balance modeling, involving trace-element and Pb-isotope compositions. Fourth, the consequence of slab-melt infiltration is geochemically modeled. Finally, the morphological evolution of the slab is examined based on thermodynamic consideration.

### Chapter 7: Conclusions

This chapter present a list of the main conclusion extracted from this study.

### Chapter 8: References

This chapter provides all the references cited within this thesis.

### Chapter 9: Appendix

This chapter contains the published article which is related to this thesis.

## 論文審査結果の要旨

The candidate conducted systematic geochemical study to Cenozoic volcanic rock located in South-West Japan. He analyzed and determined major-elements, trace-elements, ages, and Pb isotope abundances and found variation both elementally and isotopically, and proposed magma generation model.

First, based on chronology of the volcanic rocks, he revealed that felsic activity on South-West Japan was initiated at 2 Ma. Then from characteristics of major- and trace-elements, he found that adakite retains features inherited from oceanic crust. Based on topography and chronology, he demonstrated that the variations of adakite are correlated with along-arc variation in thickness of sediments on subducting slab and proposed that the physical variation on surface of the slab controls chemical variation on the adakite.

With combination of experimental petrography, seismic observation, and estimated P-T condition of mantle, he constructed a model of generation of adakite that took place on a physical window in slab during subduction and demonstrated that the model explains element and heat transportation during the subduction.

The result revealed that petrogenesis of adakite for the first time after 30 years based on geochemistry utilizing precise isotope geochemistry and the research itself is unique. Therefore, we concluded that this thesis is proper to be accepted as a dissertation of Ph.D. of Okayama University.