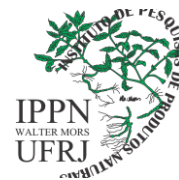




INSTITUTO DE PESQUISAS DE PRODUTOS  
NATURAIS

Bloco H, CCS, 21941-902, Ilha do Fundão, Rio de Janeiro, RJ

Tel./Fax (021) 3938-6791 / 3938-6512 e-mail: [posgrad@nppn.ufrj.br](mailto:posgrad@nppn.ufrj.br)



**Application to the Master's Degree Program 2017/1**  
**Application to the Master's Degree of the Chemistry of Natural Products in the Institute**  
**of Research of Natural Products at Federal University of Rio de Janeiro**  
**First Semester/2017**

The Director of the Natural Products Research Institute of the Federal University of Rio de Janeiro, in the use of his legal attributions, announces the opening of the selection for the Master Course in Chemistry of Natural Products in the Graduate Program in Chemistry of Products for the first semester of 2017. This notice sets forth the rules and procedures for the selection of candidates.

**1. The degree**

The student approved in the Master course will be awarded the title of Master of Science.

**2. The application period**

The application will be possible during the period between **January 04, 2017 and February 06, 2017**, from Monday to Friday, from 9:00 am to 3:00 pm, in the Graduation Office of the Natural Products Research Institute (IPPN), located in room H1-001 of Block H-1 floor of the Health Sciences Center of the Federal University of Rio de Janeiro.

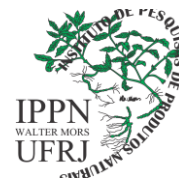
The candidates must show, at the time of the application, the documents below (original and copy):

- Graduation degree or official declaration of completion of undergraduate course;
- Identity card;
- CPF;
- Passport (for foreigners);
- Voter identification
- Reservation certificate (male candidates);
- Documented curriculum vitae (CVLattes);
- Graduate School Record;
- Application form (as the model available in [http://www.nppn.ufrj.br/download/Form\\_PG\\_CExt.pdf](http://www.nppn.ufrj.br/download/Form_PG_CExt.pdf), filled and signed by the applicant.
- 1 (one) photo 3x4;
- Letter of Acceptance from the program supervisor signed and stamped.



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## P.S.:

Candidates who are unable to attend the IPPN Office personally may apply:

- (1) by proxy;
- (2) by correspondence (entries made by correspondence will be valid as soon as they are posted within the registration deadline, with submission of originals on the day of the General Knowledge test). The proof of the date of the posting will be the postmark;
- (3) through electronic mail (e-mail), with the understanding that the registration will only be valid after the presentation of all necessary documents (originals and copies) on the day of the selection. For this, it will be enough to send a copy of the registration form, the identification document, the Graduation certificate or official declaration of completion of course and a *Curriculum vitae* pdf copy.

Registration is free.

### 3. The evaluation of candidates

The selection will be carried out by an Evaluation Committee composed of three faculty members from the Program of Chemistry of Natural Products of IPPN or by Professors, external to the program, indicated at a meeting of the Commission of Academic Supervision (CSA) and endorsed by the IPPN's Deliberative Council.

The evaluation will be carried out in three distinct stages. All stages are mandatory:

**First Step** - Approval of registrations that presented complete documentation as required in this document. Applications for registration will be rejected in disagreement with the rules of this document.

**Second Stage** - The candidate must take a written test of General Knowledge in the field of Organic Chemistry and a test of Foreign Language (English) in person. This test aims to assess the level of theoretical knowledge of the candidate.

- This stage will be held on **February 14, 2017**, scheduled to start at 9 am and finish at 1 pm, at the IPPN's auditorium.

- General Knowledge of Organic Chemistry Contents:

**a) Electronic Structure and Chemical Links in Organic Molecules:** formal charge; binding energy; atomic orbital; molecular orbital; Lewis structure; hybridization ( $sp^3$ ,  $sp^2$  e  $sp$ ); structural representation.

**b) Molecular Geometry, Binding Polarity e Intermolecular Forces:** Valence Shell Electron Pair Repulsion theory (VSEPR); dipole moment; hydrogen bonding; dipole-dipole force; ion-dipole interaction; ebullition point -solubility and intermolecular forces.

**c) Alkanes e cycloalkanes conformations:** Newman projection, conformational stability analysis; conformational equilibrium.

**d) Stereochemistry, Chirality e Molecular Assimetry:** enantiomers and chiral molecules; nomenclature of enantiomers; separation of enantiomers; optical activity, Fischer projection.



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- e) **Acid-Base Reactions:** acidity and basicity theories; Structure-reactivity relationship; Relationship between  $K_a$  and  $\Delta G$ ; Inductive effect; resonance; Aromaticity; Acidity of carboxylic acids; Solvent effect on acidity; Organic compounds database.
- f) **Reactivity:**  $S_N1$  and  $S_N2$  reactions; E1 and E2 reactions, electrophilic addition reactions at C=C; addition reactions to carbonyl; electrophilic and nucleophilic substitution reactions in aromatic systems.

### Recommended references

Organic Chemistry, Solomons, T. W. G., 12<sup>a</sup> Ed., New York, 2016.

Organic Chemistry, Leroy G. Wade, 8th Edition, Prentice Hall, New York, 2012.

3000 Solved Problems in Organic Chemistry, Estelle Meislich, Herbert Meislich, Jacob Harefkin, Schaum's solved problems series, McGraw-Hill, 1993, 704 pp.

S. H. Pine, *Organic Chemistry*, 5<sup>th</sup> Edition, McGraw-Hill, New York, 1987.

L.G. Wade, *Organic Chemistry*, 3<sup>rd</sup> Edition, Prentice Hall, New Jersey, 1995.

The candidate will take the foreign language test on **February 14, 2017, at 2:00 p.m.**, for three hours and at the same place as the General Knowledge Test. The proof will consist in the translation into Portuguese of a technical-scientific text. The examination is a compulsory requirement for students enrolled in the Graduate Program of the Federal University of Rio de Janeiro. The aim is to demonstrate minimal knowledge of the language and understanding of the literature of common use in the field of Chemistry. The candidate may use a dictionary for the test.

**Third Stage** - Curriculum and Undergraduate School Record Analysis, only for candidates who obtain an average of five or more (5.0) in the tests carried out in the first stage.

### 4. Approval

The final concept will be obtained by means of the weighted arithmetic average between the notes of the tests of the second stage and the analysis of the *Curriculum Vitae* and the School Record, based on the following formula:

$$NF = [NPCE \times 3 + NACHE \times 1] \div 4$$

where:

NF = final grade

NPCE  $\equiv$  General Knowledge test's grade (maximum = 10,0);

NACHE  $\equiv$  Curriculum and Undergraduate School Record Analysis (maximum = 10,0).

Applicants with an average of five or more (5.0) will be approved.

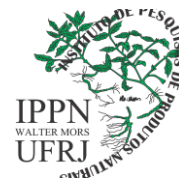
**Note:** For any tiebreakers, the grades received in the General Knowledge Test (NPCE) will be considered. The grade will be released until **February 17, 2017** in the Notice Board of the Graduate Office.



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## 5. Review

Students interested in requesting proof review may do so on **February 20, 2017**, from 9:00 a.m. to 3:00 p.m., at the IPPN Graduate Office. Only requests from students who do not reach the average for approval will be accepted.

## 6. Final Result

The list containing the names of the selected candidates, in order of classification, will be posted on the IPPN Notice Board until **February 21, 2017**. The deadline for entry into the course will follow the academic calendar of the Graduation of the Federal University of Rio de Janeiro, approved by the Rectory for the year 2017.

## 7. Of the Final Provisions

The Graduate Coordination reserves the right to resolve cases not mentioned and situations not foreseen in this notice.

By enrolling in the application, the candidate acknowledges the acceptance of the rules established in this Notice.

## 8. Scholarships: four (expected).

Rio de Janeiro, December 05, 2016.

Alcides José Monteiro da Silva  
Graduation Coordinator