*You definitely need to bring your* ***two*****chosen articles** *to the* **Lesson 9** **classroom***.*

*Preview the handout and search on the Internet to guarantee your adequacy in vocabulary, and to be well-prepared for classroom activities.*

*You may or may not need to work on* **Verb Tenses** *in this handout.*

**Lesson 9 Part II**

**Reading and Writing the Abstract**

1. **Reading and Writing the Abstract**
2. Two models of Abstract writing

**1.1** Sample Abstract 1

**Ex. 9(II)-1** *Read the following sample Abstract, and match each sentence (1-6) with the description of the writer’s purpose in writing (a-e).*

**Physical Properties of Petroleum Reservoir Fluids Derived**

**from Acoustic Measurements**

**Abstract: 1** The speed of sound in a fluid is determined by, and therefore an indicator of, the thermodynamic properties of that fluid. **2** The aim of this study was to investigate the use of an ultrasonic cell to determine crude oil properties, in particular oil density. **3** An ultrasonic cell was constructed to measure the speed of sound and tested in a crude oil sample. **4** The speed of sound was measured at temperatures between 260 and 411 K at pressures up to 75 MPs. **5** The measurements were shown to lead to an accurate determination of the bubble point of the oil. **6** This indicates that there is a possibility of obtaining fluid density from sound speed measurements and suggests that it is possible to measure sound absorption with an ultrasonic cell to determine oil viscosity.

(3, 4 ) a. The writer summarizes the methodology and provides details.

(6 ) b. The writer presents the implications of the study.

(2 ) c. The writer combines the method, the general aim and the specific aim of the study in one sentence.

(1 ) d. The writer provides background factual information.

(5 ) e. The writer indicates the achievement of the study.

**1.2** Sample Abstract 2

**Ex. 9(II)-2** *Analyze the following sample Abstract. The phrases provided in the box may help you identify what the writer focuses on in each sentence.*

*the aim of the study, the method used, the materials used, detail, results, what the paper does, the contribution*

**Effect of polymer coatings on drug release**

**Abstract: 1** This paper reports the use of a novel water-soluble polymer blend as a coating to control drug release. **2** It was found that using a blend of methylcellulose and a water-soluble copolymer significantly slowed the release rate of ibuprofen compounds in vitro and allowed for a more consistent release rate of 10-20% per hour.

**1.3** Compare the structure of Sample 1 and Sample 2

*Specify the different approaches to write Sample 1 and 2, and be ready to contribute your ideas to the class.*

Model 1: IMRC

Model 2: highlights

**Ex. 9(II)-3** *Here are two Abstracts from research papers. Analyze the structure of each Abstract, mark the essential and detailed Abstract components, and learn the use of verb tenses.*

**Optimization and Sensitivity Analysis for Multi-response Parameter Estimation in Systems of Ordinary Differential Equations**

**Abstract**

Methodology for the simultaneous solution of ordinary differential equations (ODEs) and associated parametric sensitivity equations using the Decoupled Direct Method (DDM) is presented with respect to its applicability to multi-response parameter estimation for systems described by nonlinear ordinary differential equations. (Introduction) The DDM is extended to provide second order sensitivity coefficients and incorporated in multi-response parameter estimation algorithms utilizing a modified Newton scheme as well as a hybrid Newton/Gauss-Newton optimization algorithm. (Methodology) Significant improvements in performance are observed with use of both the second order sensitivities and hybrid optimization method.(Results) In this work, our extension of the DDM to evaluate second order sensitivities and development of new hybrid estimation techniques provide ways to minimize the well-known drawbacks normally associated with second-order optimization methods and expand the possibility of realizing their benefits, particularly for multi-response parameter estimation in systems of ODEs.(Conclusion)

**Semi-Continuous Nanofiltration-Couplet Heck Reactions**

**as a New Approach to Improve Productivity of**

**Homogeneous Catalysts**

**Abstract**

Substantial increase in homogeneous catalyst productivity for a well-known Heck coupling was achieved by nanofiltration-coupled catalysis. (what the paper does, methodology, results) The use of nanofiltration membranes enabled catalyst separation and allowed subsequent catalyst recycle and reuse. (methodology) This new technique demonstrated potential for general applicability to homogeneously catalyzed organic syntheses. (the contribution)

**Ex. 9(II)-4** Look at the Abstracts in your journal articles and their structure in writing. Research on:

* **which model** of writing the Abstract **the top journals in your discipline prefer respectively**;
* **which model dominates** in writing the Abstract **in your discipline**;
* **whether** particular components would be optional in case of **Model 1** writing of the Abstract in your discipline;
* **whether** the Abstracts (in case of **Model 2**) in **your discipline** typically include particular detailed components.

1. On writing the Abstract

* Vocabulary for writing the Abstract

See *Science Research Writing* (pp. 216-221)

* Q&A upon writing the Abstract

See *Science Research Writing* (pp. 199, 206-209)

|  |  |  |
| --- | --- | --- |
| **Verb Tense** | **Components of the Abstract** | **Examples** |
| Present Simple tense | **gap/problem** | *The main problem, however, is…*  *We examine why these models have difficulty with…*  *However, this assumption is not valid when…*  *This is complicated by…*  *However, this assessment cannot be based solely on…*  *Although it is known theoretically that…* |
| **what the paper itself does / what is actually in the paper itself** | *This paper presents a new methodology for…*  *In this paper we apply…*  *This study reports an improved design for…*  *In this paper we extend an existing approach to…*  *We consider a novel system of…*  *The implications for learning algorithms are discussed…*  *New numerical results are presented here for…* |
| **Methodology**(esp. calculations or equations) | *Numerical examples are analyzed in detail…*  *The calculated wavelengths are compared to…*  *Several models are created using…*  *The accuracy is evaluated by…*  *A detailed comparison is made between…*  *The method is illustrated on blends of homopolymers…* |
| **Results/ Implications** | *We find that oxygen reduction may occur up to 20 microns from the interface…*  *The model consistently underpredicts…*  *The ratio shifts towards…*  *We show that this theory also applies to…*  *The most accurate readings are obtained from…*  *We find that this does not vary…*  *These examples illustrate that overpotential is better described in terms of…* |
| **Achievements** | *This process can successfully be combined with…*  *The framework described here is both simple and universal…*  *The value of our approach lies in…*  *This provides a powerful tool for…*  *This novel film is mechanically robust and is able to…*  *The algorithm presented here ensures that…* |
| **Applications** | *This process is suitable for the production of …*  *This framework can be used to evaluate…*  *This approach can be applied to…*  *This demonstrates potential for general applicability to…*  *These profiles may serve as a predictor for…*  *This framework can be used to evaluate…* |
| Past Simple tense | **Methodology** | *Two catalysts were examined in order to…*  *Samples were prepared for electron microscopy using…*  *A crystallizer was constructed using…*  *The effect of PH was investigated by means of…*  *The data obtained were evaluated using…*  *A permeameter was used to investigate…* |
| **Results** | *The Y-type was found to produce…*  *The hydrocarbons showed a marked increase in…*  *No dilation was observed…*  *This was consistent with…*  *Organized fibers were found after 6 weeks…*  *These profiles were affected by…*  *This finding correlated with…*  **Two tenses in one sentence**:  *The experiments demonstrated there are two matrices…*  *It was found that proteins are produced from…*  *The results demonstrated that the morphology is different…*  *This image suggested that there is a direct relationship between…* |
| Present Perfect tense | **Achievements** | *We have obtained accurate quantitative LIF measurements…*  *This investigation has revealed that…*  *We have devised a strategy which allows…*  *We have demonstrated the feasibility of this approach by…*  *A novel material has been produced which…*  *Three-dimensional FE predictions have confirmed that…*  *Considerable insight has been gained concerning…* |

**Homework:**

You are supposed to deal with potential language difficulties in the Lesson 10 （Part II Reading and Writing the Introduction to a research paper）students’ handout before the Lesson.