

# Essential elements of a results section, reading and translation [1-8]

## References:

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3. Öniz A.S. and Cross T.M. (1981)"Physical Science Reader Series" Volume I, Middle East Technical University Ankara, Turkey.
4. Glendinning E. and Mantell H., (1983), "Write Ideas", Longman Group Limited
5. Shreve N.R., Brink J. A. Jr. (1977),"Chemical Process Industries, Mc Graw-Hill, London
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8. Kimya Mühendisliği Ünit Operasyonları, 1981, McCabe-Smith'den Çeviren: Prof. Dr. Emir Gülbaran, İ.T.Ü.Mühendislik Mimarlık Fakültesi Yayınları,sayı 137, Matbaa Tek. Koll. ŞTİ, İstanbul

**Complete the sentences with the words in the list. Use each word only once.**

possible

decrease

expected

due to

possible

«It was **expected** that light intensity would cause a **decrease** in the number of stomata. Instead the opposite relationship was **possible** (Figure 1). It is **possible** that the increase in the number of stomata was **due to** an increased rate of photosynthesis.»[18]

## RESULTS

Proposed explanation of results.

Literature sources to support explanation.

Comparison to previous research.

Future experiment builds upon results of this one.

Complete the sentences with the words in the list. Use each word only once.

increases

related

possible

function

allow

higher

«The **function** of stomata is closely **related** to photosynthesis. Mesophyll cells are the most important cells for photosynthesis in the leaf and need a source of CO<sub>2</sub> (Raven et al., 2008, 737). Stomata form pores in the leaf to **allow** exchange of CO<sub>2</sub> and water through the leaf cuticle layer to the underlying mesophyll cells (Buchanan et al., 2000, 651). Photosynthesis also **increases** as the amount of light increases (Rabinovich and Govingee, 1995, 223), and it is **possible** that more stomata allow **higher** rates of photosynthesis to occur.»[18]

Complete the sentences with the words in the list. Use each word only once.

corresponds

higher

observed

reported

factors

«Other researchers have **reported** that stomatal density **corresponds** to other environmental **factors**, such as humidity and CO<sub>2</sub> concentration (Fraser et al., 2008, 773). Furthermore, mutant plants with abnormally high numbers of stomata were **observed** to have **higher** rates of photosynthesis.»[18]

[18]<http://marietta.edu/~biol/introlab/labreprt>

all sources

express

citations

essential

quoted

misled

## How to write Citations and References

It is **essential** that you identify **all sources** of information and ideas included in your report.

Do not be **misled** into believing that **citations** are only required for direct quotes. As stated above, sources should not be directly **quoted** in a report. You must, however, cite the sources of information and ideas that you **express** in your own words. [18-19]

[18]<http://marietta.edu/~biol/introlab/labreprt>

[19]<http://www.marietta.edu/~biol/library/citation.html>

# reading and translation

« Abstract - A mathematical model for the simulation of the steady-state and dynamic behaviour of multicomponent packed distillation columns using a finite element approach has been developed. The equations involved employ the two film concept of mass transfer. The finite element Galerkin formulation and orthogonal collocation on finite elements with Jacobi, Legendre and Hermite polynomials is investigated. A reason for employing the different procedures is to achieve a better approximation to the solution of the problem. The effects of increasing the number of collocation points and the use of different polynomials upon the accuracy and CPU time of the solution are reported. The finite element Galerkin method requires small spatial steps and increases the stiffness associated with the integration involved whereas orthogonal collocation on finite elements needs far fewer discretization points.

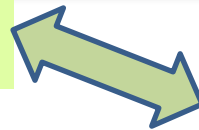
»[10]

[10]

Wardle A.P., Hapoğlu H. (1992)  
"The Use of Finite Elements in The Simulation of Packed Distillation Columns",  
The 1992 IChemE Research Event, ISBN: 0 85295 290 2, Published by:  
Institution of Chemical Engineers, Manchester, U.K., 576-579

Çok bileşenli dolgulu damıtma kolonlarının dinamik ve yataşkın hal davranışlarının benzetimi için ve sonlu elementler yaklaşımı kullanılarak matematiksel bir model geliştirilmiştir. Bu modeldeki denklemlerde kütle aktarımı için iki film kuramı kullanılmıştır. Galerkin formülüne dayalı sonlu element yöntemi ve Jacobi, Legendre veya Hermite polinomlarının kullanımı ile sonlu elementler üzerine ortogonal kolokasyon metodları incelenmiştir. Problemin çözümüne daha iyi yaklaşım sağlamak için farklı yöntemlerin kullanılması amaçlanmıştır. Kolokasyon noktaları sayısını artırmanın ve farklı polinomlar kullanmanın, doğruluk ve gerekli bilgisayar işlem zamanı üzerindeki etkileri verilmiştir. Sonlu elementler Galerkin metodu, küçük konumsal basamaklar gerektirmekte ve integral alma işleminde sayılar arası fark sınırlamasını yükselmektedir. Diğer taraftan sonlu elementler üzerine ortogonal kolokasyon yöntemi daha az sayıda ayırım noktalarına gerek duymaktadır.

**Dolgulu Damıtma Kolonlarının Benzetiminde  
Sonlu Elementler Metodunun Kullanımı**



(The Use of Finite Elements in the Simulation of Packed Distillation Columns)

«

ABSTRACT

The performance of adaptive self-tuning PID (STPID), generalised minimum variance (GMV) and generalised predictive control (GPC) are examined when applied to the overhead product composition control of a packed distillation column. The success of the various control actions are estimated using an integral square of the error (ISE) criterion and it is shown that the values of the latter differ according to the sampling interval selected. It is found that, when a discrete time model is used with sampling times of 0.5 min and 1 min, STPID and GPC are the most successful control actions. The constant offset problem of GMV control is solved by employing a new combination of some previously published methods. In the present work, the polynomial  $Q$  is of the form  $\lambda(1-z^{-1}).\alpha(u)$  and is varied as a trade-off between model-following performance and fluctuations in the controlled variable. The GMV strategy with this new form of the  $Q$  polynomial gives reasonable control when compared with STPID and GPC action.

»[12]

[12]

Wardle A.P., Hapoğlu H. (1993)  
"The Self Tuning Control of Packed Distillation Columns",  
Modelling, Identification and Control, ISBN: 3 7153 0003 5, A Publication  
of The International Association of Science and Technology for Development  
-IASTED, Int. Conf., Innsbruck, Austria, 431-435

Kendinden ayarlamalı PID (STPID), genelleştirilmiş minimum değışmeli (GMV) ve genelleştirilmiş tahmin edici kontrol (GPC) metodları, dolgulu damıtma kolonu üst ürün derişimi kontrolünde kullanılmış ve etkinlikleri incelenmiştir. Değişik kontrol yöntemlerinin başarısı, hata kareleri integrali (ISE) ölçütüyle değerlendirilmiş ve kontrol etkinliğinin, seçilen örnekleme zaman aralığına bağı olarak değıştiğı saptanmıştır. Kesikli zaman modelinde 0.5 ve 1 dakikalık zaman aralığı kullanıldığında, STPID ve GPC 'nin en etkin kontrol yöntemleri olduğı gözlenmiştir. GMV kontrol metodunda karşılaşılan sabit offset problemi, literatürde yer alan yöntemlerin yeni bir kombinasyonu ile çözülmüştür. Bu çalışmada, Q polinomu  $\lambda(1-z^{-1})\alpha(u)$  şeklindedir ve bu polinomun değeri, kontrol edilen değışkendeki dalgalanmalar ile modelin performansı arasındaki kabul edilebilir dengeye göre değıştirilmiştir. Q polinomunun bu yeni şeklini içeren GMV kontrol metodu, STPID ve GPC ile karşılaştırıldığında daha iyi bir kontrol sağlamaktadır.