POSTER HAZIRLANMASI

Poster çalışmasına karar verilmesi

Diploma Projesinin poster olarak sunulup sunulmayacağı konusundaki kararı, danışman öğretim üyesi ve Diploma projesini yapan öğrenci projenin ödevinin teslim tarihinden iki ay önce vererek sonucu bölüm başkanlığındaki ilgili bölüm başkan yardımcısına bildirir.

POSTER HAZIRLAMA STANDARTLARI

- Hazırlanacak posterler 70x100 boyutlarında ve tek parça olmalıdır.
- Posterde her türlü objenin ve metnin yerleştirilmesine alttan, üstten, sağdan ve soldan en az 5 cm içerden başlanmalıdır.
- Postere yerleştirilen metin kısımları en az 20 punto büyüklüğünde başlıklar en az 30 punto büyüklüğünde olmalı ve başlık kalın olarak yazılmalıdır.
- Başlıklardan önce ve sonra en az 30 punto boşluk bırakılmalıdır.
- Diploma projesi konusunun adı posterin en üstünde yer almalı ve en az 80 punto büyüklüğünde olmalıdır.
- Diploma projesi isminin her iki yanında Ege Üniversitesi ve Ege üniversitesi kimya mühendisliği logoları yer almalıdır.
- Konu isminin yer aldığı kısmın hemen altında diploma projesini hazırlayan öğrencinin, danışman öğretim üyesinin ve bölümün kimlik bilgisi yer almalıdır.
- Öğrenci ve danışman öğretim üyesi ve üniversite kimlik bilgileri 16 punto büyüklüğünde olmalıdır.
- Kimlik bilgilerinin altında 100 kelimeyi geçmeyecek şekilde ve 16 punto karakter büyüklüğünde bir İngilizce birde Türkçe özet kısmı yer almalıdır.
- Poster içeriği diploma projesinin konusuna bağlı olarak değişebilir ancak her posterde İngilizce özet, Türkçe özet, tartışma sonuçlar ve kaynaklar kısımları bulunmalıdır.
- Posterde yer alan şekil ve tablolar numaralandırılmalıdır.
- Kaynakların yazılımında diploma projesi hazırlama standartları ile ilgili esaslara uyulmalıdır.
- Ek – 1 de örnek bir posterin genel görüntüsü verilmiştir.

Ek 1: Poster örneği

COMPARISON OF THE RESULTS OF "CRANE" AND "ChemCAD" BASED ON PHYSICAL PROPERTIES CALCULATIONS

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Physical properties like bubble point, dew point, enthalpy and etc. are very important to determine the process conditions and the features of the end products in the different industrial applications. Making these calculations manually takes long time. It is convenient to use a computer program when doing these calculations.

In this work a computer program (CRANE) is searched, modified and the results about the physical properties (Bubble Point, Dew Point, Density and Vapour pressure) of mixtures were tested by matching CHAMCAD 5.1 and experimental results given in literature.

The basic components of CRANE

A database that involves the constants of physical properties.
A module that provides user friendly Windows to input data.
A module that involves calculation procedures of physical properties.

Database

Database of crane contains huge amount of inorganic and organic compounds. Whereas organic matters are all compounds whose carbon number from 1 to 20 and these 20 groups are also divided to subgroups by hydrogen and additional atoms. Database involves the following constants belong these 623 components

- Molecular weight
- Normal freezing point
- Normal boiling point
- Critical temperature
- Critical pressure
- Critical volume
- Critical compressibility factor,
- Pitzer's Accentric factor
- Dipole moment
- Constants of isobaric heat capacity
- Standard enthalpy of formation for the ideal gases
- Standard Gibbs energy of formation for the ideal gases
- Constants of vapour pressure

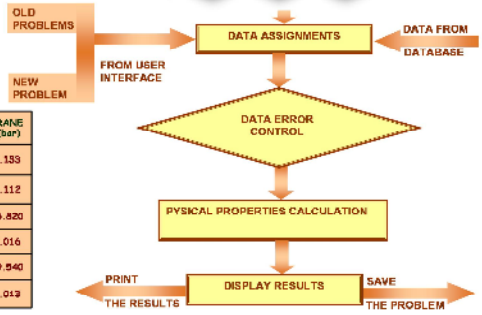
Data screen and data assignments

Data screen provides a user friendly interface to input data such as the selection of the components in mixture, the mixture temperature and pressure, and the fractions of compounds in mixture. The same screen also gives information about the physical properties constants of compounds in normal conditions.

Physical Properties Calculations

The physical properties calculation involves ten modules. each of the modules involves the procedures to calculate one physical property of the mixture. Additionally this part involves the procedures of the numerical methods using in calculations of the physical properties. The modules in physical properties calculations are;

- Bubble point calculation
- Dew point calculation
- Density calculation
- Diffusivity calculation
- Viscosity calculation
- Enthalpy calculation
- Heat capacity calculation
- Vapour pressure calculation
- Surface tension calculation
- Thermal conductivity calculation
- Heat of vaporization calculation



Bubble Point

Components	Pressure (bar)	Experimental (K)	CHEMCAD (K)	CRANE (K)
Diethylamine	0.533	311.15	311.05	310.55
Nonane	1.013	423.95	423.74	424.00
Toluene	10.13	488.95	490.54	490.40
Methylchloride	20.26	350.45	349.65	349.01
Diethylamine	40.53	422.95	422.16	421.73
Methyl-mercaptan	60.795	456.15	456.62	457.54

Dew Point

Components	Pressure (bar)	Experimental (K)	CHEMCAD (K)	CRANE (K)
Fleurobenzene	0.267	320.35	320.22	319.66
Benzene	0.133	299.25	299.26	298.83
Methylbromide	10.13	357.15	354.08	354.69
Ethylacetate	20.26	482.65	481.63	481.65
Diethyleter	40.53	422.95	422.16	421.73
Methylamine	60.795	417.75	417.71	418.23

Vapor Pressure

Components	Temperature (K)	Experimental (bar)	CHEMCAD (bar)	CRANE (bar)
Ethylbenzene	347.200	0.133	0.130	0.133
Acrilonitrile	293.150	0.117	0.087	0.112
Isopropanol	450.000	16.160	15.700	15.820
Acetone	350.900	2.016	2.016	2.016
Water	548.700	60.000	60.020	59.540
Chlorobenzene	404.900	1.013	0.996	1.013

Bubble Point (For Mixture)

Components	Pressure (bar)	Experimental (K)	CHEMCAD (K)	CRANE (K)
Methanol-Water	0.2625	333.15	336.23	336.93
Ethanol-Benzene-Methylcyclopentane	1.013	336.15	345.56	368.15
Propanol Water	1.01	364.85	360.60	370.64
Propane-iButane-Butane-2Methylbutane-Pentane	8.274	-	355.07	352.74
Methanol-1,2 Dichloroethane	0.9066	333.15	336.48	336.10
Ethane-Propane-Pentane	12	-	283.00	282.37
Ethane-Propane-iButane	10	-	273.67	273.13

Density

Components	Temperature (K)	Pressure (bar)	Experimental (cm³/mol)	CHEMCAD (cm³/mol)	CRANE (cm³/mol)
Acetone	329.2	1	77.60	77.18	77.33
i-Butane	310.93	137.9	102.70	102.53	103.12
Trifloroethane	300	13.068	91.01	86.85	92.38
Methylchloride	333.15	13.76	1635.60	1675.92	1672.90
Ammonia	338.15	23.82	1021.21	1017.72	1010.82
Methane	323.15	182.58	128.20	132.20	129.69

Dew point (for Mixture)

Components	Pressure (bar)	Experimental (K)	CHEMCAD (K)	CRANE (K)
Ethane-Heptane	39	-	543.14	543.52
Ethane-Propane-iButane-Pentane	10	-	351.164	351.676
Ethylbenzene-Styrene	2	-	442.563	441.710
Benzene-Toluene-Oxylene	1	-	420.79	420.42
Ethane-Propane-Butane	12	-	310.16	311.48
Ethanol-Water	2	-	364.10	363.89

In this study, a computer program of CRANE which can calculate the physical properties of mixtures in given conditions was modified and tested. CRANE has a moduler structure. This is an important advantage, because it can be analysed and new calculation modules can be added easily. So in this work new calculation procedures have added to increase robustness of CRANE. The modules of Bubble Point, Dew Point, Density and Vapor Pressure calculation procedures were modified. Then, the physical properties calculations' results were tested by the results of Chemcad 5.1 and experimental values in literature. The results were observed (Tabulated above) that the density and vapor pressure calculations' results agree with the Chemcad 5.1 and experimental values. The percentage errors were less than % 3 for the vapor pressure and density calculations, and less than % 10 for the bubble and dew point calculations.

The errors can be decreased by adding rigorous estimation thecniques which serve more exact results in multicomponent mixtures (Especially new activity coefficient estimation methods can be used). The addition of rigorous techniques to calculate more accurate results for tested properties and test of other physical properties involved in Crane are recommended as a new project.

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