

RESEARCH METHODOLOGY (SQG2613)

Literature Review

Dr Nik Ahmad Nizam Bin Nik Malek,

BSc (Ind. Chem.)(UTM), MSc (Chem)(UTM), PhD (Chem)(UTM), A.M.I.C Senior Lecturer,

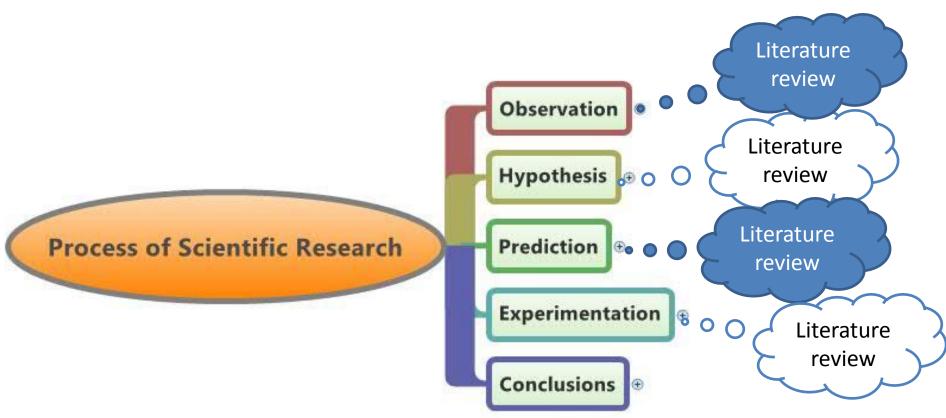
Department of Biotechnology and Medical Engineering Faculty of Biosciences and Medical Engineering



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Literature Review





OBSERVATION

-Obtain information- -Literature review-

-problem-



-knowledge- -literat

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PREDICTION

-scientific knowledge-

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EXPERIMENT

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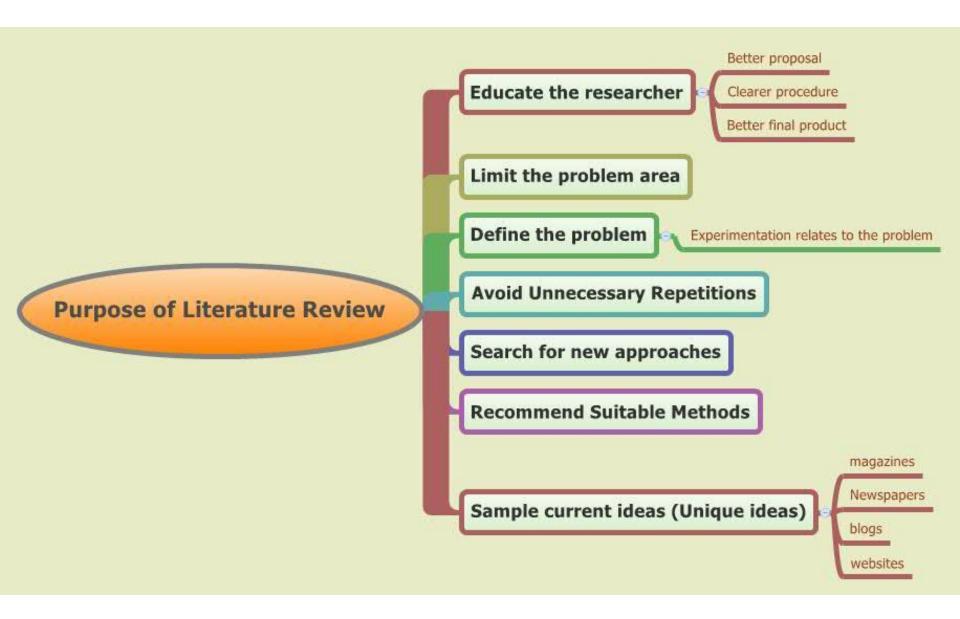
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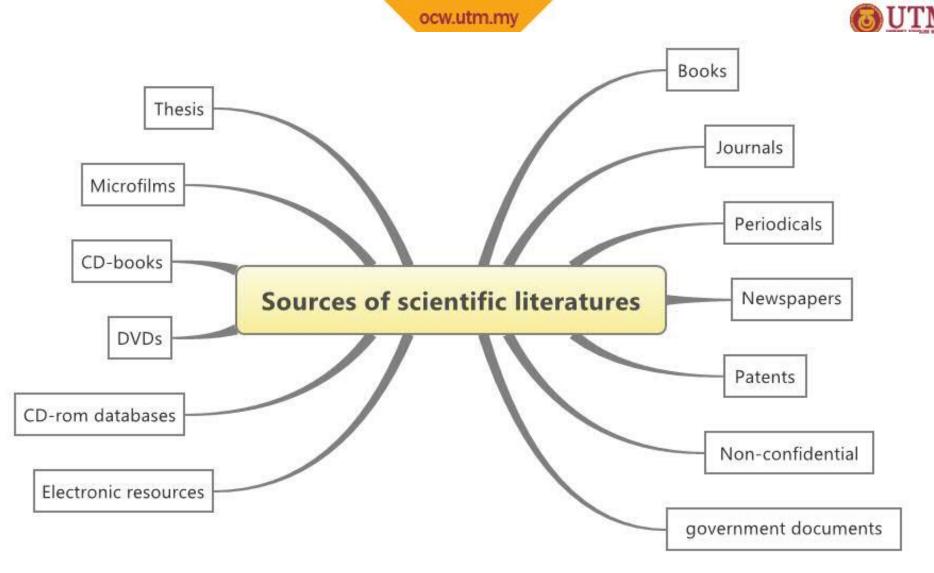
-literature review-

CONCLUSION

-report- -paper- -journal- -patent- etc







Learning how to use these resources properly is equally as important as learning any laboratory techniques and other technical skill.



Example of Scientific Journal

Science of Discounters Marriage 962 (2009) 955-955



Contents lists available at ScienceDirect

Journal of Hazardous Materials





Removal of Cr(VI) and As(V) from aqueous solutions by HDTMA-modified zeolite Y

Alias Mohd Yusof*, Nik Ahmad Nizam Nik Malek

The partners of University Parally of States and Discount Dataship Malaysia, 2018 States Links Delaysia.

ARTICLE INFO

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ABSTRACT

The synthesized cestive NeY from rice brack and (BHA) and the commercial resides NeY both modified with surfactants in amounts equal to \$80. MOS and 2005 of their external cation exchange capacity (EEC) were used to remove chromate and amounts and an expense substitute. While the unreadiled another V had limite or no affinity for the Cr(M) and As(M) amount species, the surfacture-modified resides V (SMZM) showed significant ability to remove of these axions from the aspectus solutions. The highest chromates and assential accordance of the univalent species of both anions. The advertises. The highest expertisely because of the Language isotherm model with the highest emocyal capacities observed sometimes of the SMZM initially prepared considering the headersylvicinethyl artenismisms (HDTMA) amount equal to the 3005 of the EEE of positiv V. Synthesized SMZM remove C(W) and As(W) more than the corresponding constructed one due to its lower sides to aluminar ratio. Thus, the HDTMA-convexed modified another V synthesized using BHA can be used to remove C(W) and As(W) from notice.

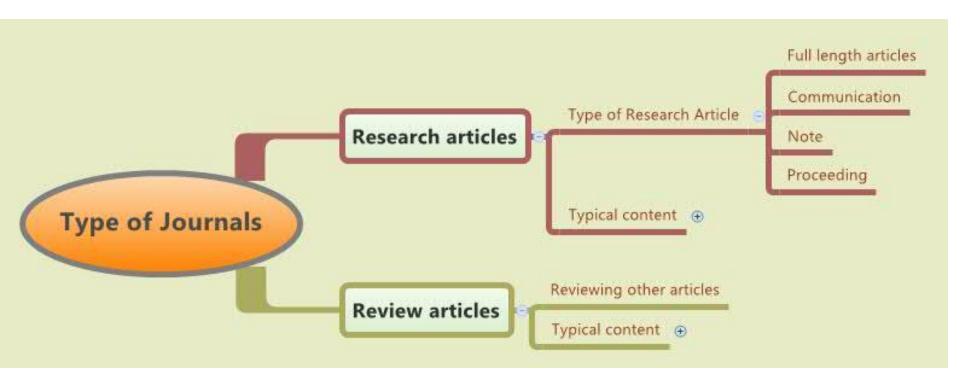
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L. Introduction

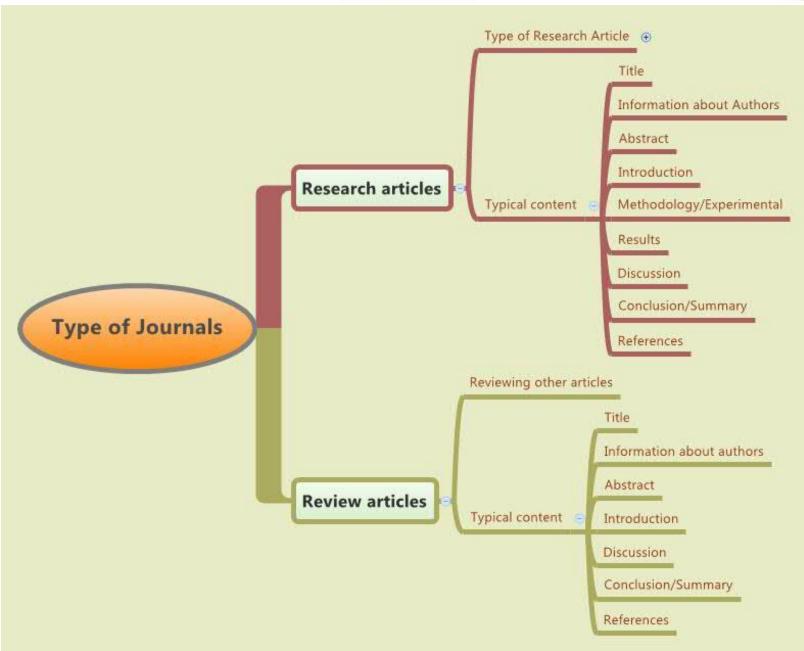
The presence of chemitate (Cr(VII) and amenate (As(VI)) arising various sources of seatur are populational insues since the toxicsty of these species can result in death if these species are taken either over a long period of time or present in high concentrations. The chemical form of chooseates determines their potential toxicity as Cr(VII) is believed to be carrieogenic in framew than Cr(III) species [1]. The carrieogenic and tentrity of Cr(VI) is based on its existation state where the chromate axion resembles the form of subtates and observables. [2]. Amenate which is in the membrane should be orduced to 10⁻¹ mgL⁻¹ [5]. For attentic species, EPA adopted a new standard and public water mast comply with the 0.010 mgL⁻¹ standard beginning 23 January 2006. Since Cr(VI) and An(V) are very trotic, carcinogenic and very harmful to human beings, to addition, the requirement to comply with the regulation made by the governments, the importance of removing both trotic metals in various sources before discharging them into the surface water streams or for shirking mater is very crucial and

In the aqueous solutions, Cr(VI) is very soluble and exists in the form of character and (H-Cr(L)) and in the form of dicharacter.







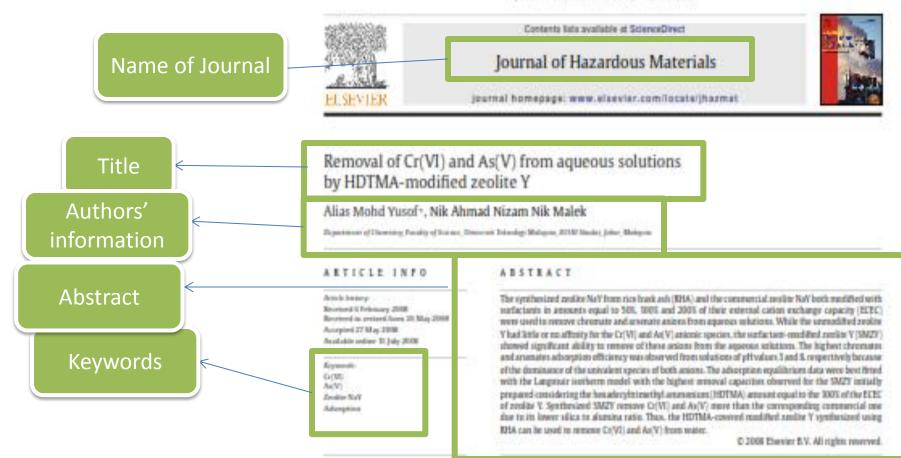




Elements in Scientific Journal

Introduction

Journal of Recession Marrials 942 (1989) 916 - 916



L. Introduction

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Elements in Scientific Journal

Methodology/ Experimental

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Elements in Scientific Journal

Results and Discussion

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Fig. 1. When a pill estate over the 1-7th exampling MET.

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2.2.2. Surfaces mode.

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1. Breaks and discovering

11. Advergence of OCFE-motive

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Money HTT, the directional species is the pelline discounts arise, Odly between ST and Strilly and delermor on Toylare in regulative and [15]. However, [15] what we got represent our MC-GE at pHTV and CVDy ... or pHT2 flor upon of the distribution of CVTH1 in maries which is in the lines of arms, it is should reduced that the positive T that has been modified with cultimate station and are sainable in advant CoVII specimenesses as suitable yETTer always. time effections; of GrM1 may highest at pH.1 for stalls of the BMPY. what for altoration developed plans the all transport. This is disto the discounce species of D/MI solutionals to reper and the reclusings a specify of the MATY for our opinion. Its described above at larger pHI, the CoM2 species are usually in the assistance have (KE) Eq. (and this regime our reclusion size its toir mobility of CoVII represent that pill, becampast, at high pill, the displess here. of Deliff species (Depth - Dally 1) are assess present and seventheir two rechange when home MATY for the addression to some This resulted in higher treasural aspects; of \$4500 species by BMAY at latery pff risket that at higher pff. Its addition, the leaves affectly of DeMC congress at pill 10 may also be selfaneared by the money competition from TET with the conference should be the on prior when come many (IV) among are purposed at high pills in [10] along Water Conduct reference as at plf II as made II - more described as tion pH. In addition, at pH radies greater than I, the presence of (BF) test items the lipscoop! completen of itemscore. The Dr. (B) sprior on very while in approxy relations and they actalogy more service of the discretizate it is an provide all territories and the of BMAT on administration with philodology of it and before

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4. Conclusions

Zeolite Y basically has little or no affinity to the arross species of Cr(VI) and As(V), but the modification of reolity Y by the cationic verfactors (HDTMA) can enhance the advergation capacities of Cr(VI) and As(V) on the zeolite Y. The restoral capacities of Cr(VI) and As(V) on SM2Y are dependent on the pit of the solution whereby the highest removal capacities for Cr(VI) and An(V) are observed at pH 3 and 8, respectively. At those pH, both species were in the unicalest firms which only need one exchange site from the SMZY, hence, more Cr(VI) and As(V) species can be adsorbed by the SMZY. The adsorption of Cr(VI) and Ar(V) on the SMZY fitted well on the Lasgmair isotherm equilibrium with SMZY with HOTMA amount equal to the 100% of ECEC of norbits Y showed the highest advorption capacity. Surfactant-modified prolite Y derived from the synthesized availably tond to advoch more Cr(Vi) and As(V) that the commercial one. This is that to the physicochemical peoperties of these prolites where the Zen-NaY-5 has lower silica to elumina ratio, higher CEC and ECEC as well as higher specific surface area compared to Zeo-NaY-C which creates more exchange sites for the advorption process to occur. Thus, the synthesized reolite NaV from rice basic ash teauted with HDTMA can be used as a potential surfacest to remove becarvalent change into (Cr(VI)) and postagolism arrenaic (As(V) from water.

Acknowledgementy

We thank the National Science Development & Rewarch Council (MPKSN) for the financial support gives under contract no. IRIA 09-02-0037-5800005/06-0, Vot 74511, the Malaysian Nuclear Agency and the Department of Chemistry, University Telesology Malaysia.

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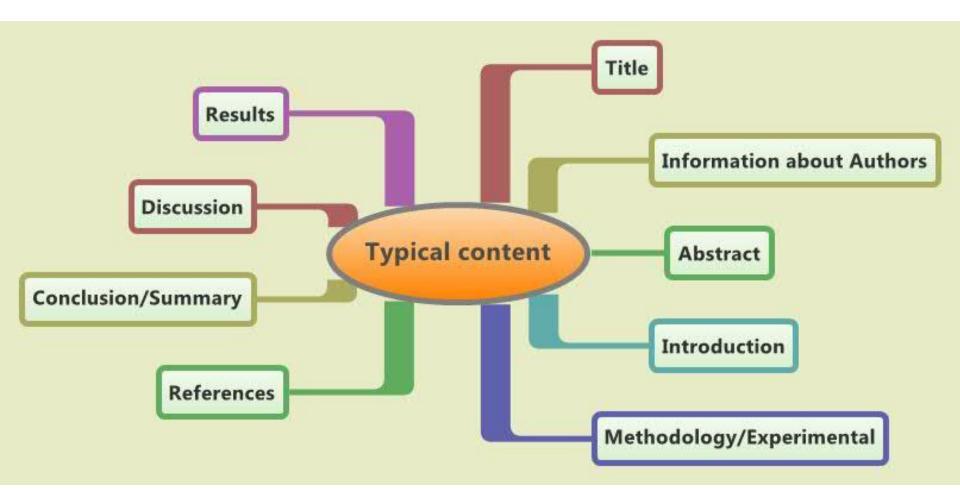
References

Conclusion





Information from Journals





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Name of Journal

Quality of journal

- Impact factor of journal
- •Aim and scope of research area

Removal of Cr(VI) and As(V) from aqueous solutions by HDTMA-modified zeolite Y

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Department of Discreting Faculty of Science, Discrete Delanday, Malayon, 2018; Sinder, John, Melayon.

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ABSTRACT

The synthesized resides NAY from rice bank ash (BHA) and the commercial resides NAY both modified with surfactants in absounts equal to 50%. 180% and 200% of their external cation exchange capacity (ECEC) were used to remove chromate and average anions from aqueous solutions. While the unmodified resides Y had little or no afficially for the Cr[W] and Ac[V] anionic species, the surfaction-condition modified position Y (SMZY) showed significant ability to remove of these anions from the aspectus solutions. The highest chromates and arismates advergation officiency reas observed from solutions of pH values. I and S. respectively because of the dominance of the univalent species of both anions. The advergation equilibrium data were best fitted with the Langmost isotherm model with the highest empoyal capacities observed for the SMZY initially prepared considering the hexade cylinizatish areasonisms (HDTMA) around equal to the 300% of the ECEC of reside Y. Synthesized SMZY remove Cr(W) and As(V) more than the corresponding contentral using BHA can be used to remove Cr(W) and As(V) from easier.

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L. Introduction

The presence of chemisate (Cr(VI)) and amenate (As[V]) animize in various sources of water are popularent issues since the toxicity of these species can result in death if these species are taken either over a long period of time or present in high concentrations. The chemical form of choosastes determines their potential toxicity as Cr[VI] is believed to be carrinogenic in formers than Cr(III) species [1]. The carcinogenic and toxicity of Cr(VI) is based on in oxidation state where the chromate anion resembles the form of sultate and obscribes [12]. Assesses which is in the manipulation should be ordured to 10⁻¹ reg L⁻¹ [5]. For aromic species, EPA adopted a new standard and public some mass comply with the 0.010 reg L⁻¹ standard beginning 23 January 2006. Since Cr(VI) and An(V) are very train, carcinogenic and very harmful to human beings, in addition, the requirement to comply with the regulation made by the governments, the importance of removing both train metals in various sources before discharging them into the surface water streams or for shirking mater is very crucial and critical.

In the aqueous solutions, Cr(VI) is very soluble and exists in the form of chronic sold (H-Cr(L)) and in the form of dichements.



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Title

- Scope of overall research
- Technology used in this research
- Keywords
- Scientific words
- Main finding

Removal of Cr(VI) and As(V) from aqueous solutions by HDTMA-modified zeolite Y

Alias Mohd Yusof , Nik Ahmad Nizam Nik Malek

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Erymonic Gr(W) Au(V) Zeolite NaV Advention

ABSTRACT

The synthmized coulde NaY from rice brack ash (EHA) and the commercial swifter NaY both modified with surfactants in accounts equal to 50%. 180% and 200% of their external cation exchange capacity (ELEC) were used to remove chromate and assente anions from aqueous solutions. While the unmodified avoider V had limb or no affectly for the Cr(VI) and As(V) anionic species, the surfaction-condition and assente ablility in remove of these acions from the aqueous solutions. The highest chromates and assente absorption officiency was observed from solutions of pH values. It and S. respectively because of the dominance of the univalent species of both acions. The adsorption equilibrium data were best fitted with the Langentar isotherm model with the highest amount capacition observed for the SMZY initially prepared considering the hexadocylnimethyl astronomical (HDTMA) amount equal to the 300% of the ELEC of problem V. Synthesized SMZY remove C(VI) and As(V) move than the corresponding contention on the to its lower size to a surface ratio. Thus, the HDTMA-convent modified amiliar V synthesized using RHA can be used to remove Cr(VI) and As(V) from mater.

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L. Introduction

The presence of chemistre (Cr(VI)) and amenate (As[V]) animize in various sources of mater are prominent insues since the toxicity of these species can result in death if these species are taken either over a long period of time or present in high concentrations. The chemical form of chemistre determines their potential toxicity as Cr[VI] is believed to be carrinogenic in formars than Cr(III) species [1]. The carcinogenic and toxicity of Cr(VI) is based on in acidation state where the chromate axion resembles the form of sultate and observables. should be ordured to 10⁻¹ mg L⁻¹ [5]. For arranic species, EPA adopted a new standard and public water must comply with the 0.010 mg L⁻¹ standard beginning 23 January 2006. Since Cr(VI) and As(V) are very toxic, carcinogenic and very harmful to burnar, beings, in addition, the requirement to comply with the regulation made by the governments, the importance of removing both toxic metals in various sources before discharging them into the surface water streams or for discloring mater is very crucial and

In the aqueous solutions, Cr(VI) is very soluble and exists in the form of changing acid (H-Cr(L)) and in the form of dichemosts.



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Removal of Cr(VI) and As(V) from aqueous solutions by HDTMA-modified zeolite Y

Alias Mohd Yusof*, Nik Ahmad Nizam Nik Malek

Department of Discreting Facality of Science, Discrete Delayday, Malaysia, 20180 Studey, John Melaysia.

Abstract

•Abstract tells about:

- Aims/objectives/goals of the paper.
- Significant method.
- Significant results.
- Significant discussion.
- Significant conclusion

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ABSTRACT

The synthesized restite NaY from rice back ash (BHA) and the commercial restite NaY both modified with surfactoris in absounts equal to 50%. 190% and 200% of their external carion exchange capacity (ECEC) were used to remove chromate and assente asions from aqueous solutions. While the unesodified restite Y had little or no affectly for the Cr[VI] and Ac[V] anionic species, the surfaction-condition restite Y (SMZY) aboved agreement ability to remove out these axions from the aspectus solutions. The highest chromates and assentes aborption officiency reas observed from solutions of phisylates. I and 3, respectively because of the continuous of the univalent species of both asions. The adoption equilibriors data were best fitted with the Langmost isotherm model with the highest amoval capacities observed for the SMZY initially prepared considering the hexade cylinization highest amoval capacities observed for the SMZY initially prepared considering the hexade cylinization for an account of an abortion of the 100% of the ECEC of reside Y. Synthesized SMZY remove Cr(VI) and As(V) more than the corresponding contential using BHA can be used to remove Cr(VI) and As(V) from easier.

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In the aqueous solutions, Cr(VI) is very soluble and exists in the form of chargonic sold (H-Cr(h)) and in the form of dichemists.



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Content in Introduction

- Discussion about the problems/issues.
- Literature review Revision of other papers reported on the same topic.
- Aims and scope of research.

Removal of Cr(VI) and As(V) from aqueous solutions by HDTMA-modified zeolite Y

Alias Mohd Yusof+, Nik Ahmad Nizam Nik Malek

Department of Chemistry Parally of Statute, Disserved Delaying Malayon, 2018/ State; John Melayon.

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In the aqueous solutions, Cr(VI) is very soluble and exists in the form of chromic with (H,Cr(L) and in the form of dichemists.

Introduction



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- How author write about introduction.
- How author review related papers from other sources.
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Removal of Cr(VI) and As(V) from aqueous solutions by HDTMA-modified zeolite Y

Alias Mohd Yusof+, Nik Ahmad Nizam Nik Malek

Dispersions of Dispersion Faculty of National Dispersion Delaying Malayon, 20187 Studies John Melayon.

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In the aqueous solutions, Cr(VI) is very soluble and exists in the form of chromic acid (H-Cr(L) and in the form of dichemistic

Introduction

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- Materials.
- Specific methods/procedure.
- Scientific methods/terms/units.
- Skills in writing methodology.

Methodology/ Experimental

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4. Conclusions

Zeolite Y basically has little or no affinity to the amost species of Cr(VI) and As(V), but the modification of reolity Y by the cationic verfactors (HDTMA) can enhance the advergation capacities of Cr(VI) and As(V) on the zeolite Y. The restoral capacities of Cr(VI) and As(V) on SM2Y are dependent on the pit of the solution whereby the highest removal capacities for Cr(VI) and An(V) are observed at pH 3 and 8, respectively. At those pH, both species were in the unicalest firms which only need one exchange site from the SMZY, hence, more Cr(VI) and As(V) species can be adsorbed by the SMZY. The adsorption of Cr(VI) and Ar(V) on the SMZY fitted well on the Lasgmair isotherm equilibrium with SMZY with HOTMA amount equal to the 100% of ECEC of notity Y showed the highest advorption capacity. Surfactant-modified resists Y derived from the synthesized anchite Y tend to advoch more Cr(Vi) and As(V) that the commercial one. This is that to the physicochemical peoperties of these prolites where the Zen-NaY-5 has lower silica to elumina ratio, higher CEC and ECEC as well as higher specific surface. area compared to Zee-NaY-C which creates more exchange sites for the advorption process to occur. Thus, the synthesized reolite NaV from rice bank ash traused with HOTMA can be used as a potential surfacest to remove becarvalent change into (Cr(VI)) and postagalent arrenaic (As(V) from water.

Acknowledgements

We thank the National Science Development & Rewarch Council (MPKSN) for the Enancial support given under contract on IEDA 05-02-0037-5800005/08-0, Vot 74511, the Malaysian Naclear Agency and the Department of Chemistry, University Telesologi Malaysia.

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Conclusion

- Special finding from the overall results and discussion.
- Determine the novelty of the research.



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Acknowledgements

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Example of literature review

Recently, the utilization of natural zeolites, particularly clinoptilolite modified with cationic surfactant (SMZ) with the purpose to remove multiple types of contaminants from water was studed by many researchers especially from Li and Bowman groups [9,10,11,12,13]. Recent study by Campos showed that the modification of mordenite by ethylhexadecyldimethyl ammonium [EHDDMA] and hexadecyltrimethyl ammonium (HDTMA) can remove hexavalent chromium [14]. In addition, Perez Cordoves and his co-workers [15] have studied for the first time that the affinity distribution analysis combined with the Freundlich binding model allows the characterization of the SMZ binding properties for Cr(VI). Besides that, the surfactant-modified natural zeolites such as stilpite and laumontite [16] and clinoptilolite-heulandite rich tuffs [17] were also used to remove arsenic from water and the results



Example of Literature Review



Food Microbiology



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Optimization of pressure-induced germination of *Bacillus sporothermodurans* spores in water and milk

C. Aouadhi a,b,d,f, H. Simonin b,d,*, H. Prévost c,e, M. de Lamballerie b,d, A. Maaroufi a, S. Mejri f

The germination of spores by pressure has been studied extensively for some species of Bacillus such as Bacillus subtilis (Minh et al., 2010), Bacillus polymyxa (Shigeta et al., 2007), Bacillus cereus (Opstal et al., 2004), and some species of Clostridium (Kalchayanand et al., 2004). Two possible mechanisms of pressure-induced germination have been described. Pressure between 50 and 400 MPa can induce spore germination through the activation of germination receptors (Pelczar et al., 2007); however, pressure above 400 MPa does not activate nutrient receptors but possibly causes the release of Ca-dipicolinic acid (DPA), which triggers the cortex-lytic enzymes (CLEs) (Paidhungat et al., 2002).

Few studies have investigated the factors affecting spore germination and inactivation with HP. For example, the pressure-induced germination spores of *B. cereus* and *B. subtilis* increase with temperature or pressure-holding time (Raso et al., 1998; Minh et al., 2010).

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Example of Literature Review



Chemosphere

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Biodegradation of 4-aminobenzenesulfonate by *Ralstonia* sp. PBA and *Hydrogenophaga* sp. PBC isolated from textile wastewater treatment plant

Han Ming Gan^a, Shafinaz Shahir^b, Zaharah Ibrahim^b, Adibah Yahya^{a,*}

1. Introduction

4-Aminobenzenesulfonate (4-ABS) is one of the most commonly found sulfonated aromatic amines. It is widely used as an intermediate in the production of textile dyes, sulfonamide drugs, optical brighteners and pesticides. In nature, the biodegradation of 4-ABS is problematic. Unless there is a specific transport system for 4-ABS, the negatively charged sulfonate group would prevent uptake of the substrate through the bacteria membrane (Hwang et al., 1989). Even if bacteria develop an efficient uptake mechanism for 4-ABS, the thermodynamic energy barriers exerted by both the resonance-stabilized aromatic ring and C-S bond of 4-ABS have to be overcome in order to harness energy from this compound (Wagner and Reid, 1931). Furthermore, 4-ABS could exhibit bacteriostatic activity by inhibiting the folate synthesis pathway which is crucial for the maintenance of deoxynucleotide precursors pool and DNA synthesis (Brown, 1962; Dallas et al., 1992). To date, the biodegradation of 4-ABS is still a rare occurrence in the microbial community found in natural soil, polluted

harbor sediment and even activated sludge from some wastewater treatment plants (Alexander and Lustigman, 1966; Tan et al., 2005; Yemashova and Kalyuzhnyi, 2006).

The consumption of most sulfonated aromatic amines commonly will result in the rapid excretion from organism (Greim et al., 1994). However, study in rats showed that 4-ABS has the longest retention time following ingestion as compared to its other counterparts (Honohan et al., 1979) thus making it the most significant compound to study. Under constant exposure to this compound, some negative effects of 4-ABS have been reported including hyperactivity in rats (Goldenring et al., 1982) and significant decrease in the nitrogen transformation processes in soil (Topac et al., 2009).

One of the most important sources of 4-ABS is sulfonated azo dyes. In textile industries, sulfonated azo dyes are commonly used due to its stronger binding to the fiber and lower toxicity as compared to its non-sulfonated analog. Biological treatment of textile wastewater is highly favored due to its cost-effectiveness and higher sustainability as compared to physicochemical treatment (Pearce et al., 2003). In many of the studies found in the literature, the biological treatment of textile waste involves a two-stage process: decolorization and mineralization. In the decolorization stage, an anaerobic condition is provided to stimulate reductive cleavage of azo bond by redox active compounds of bacterial origin

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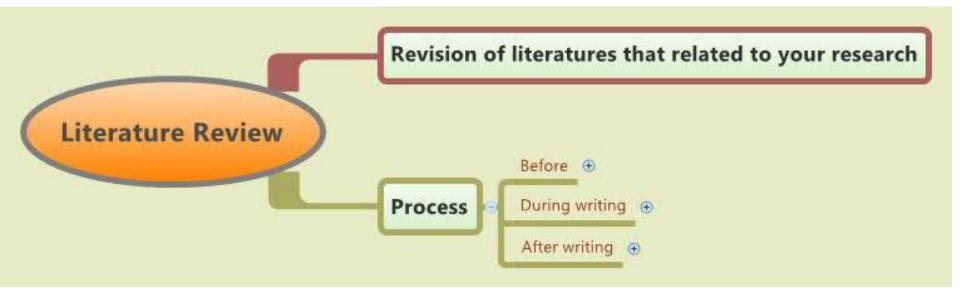


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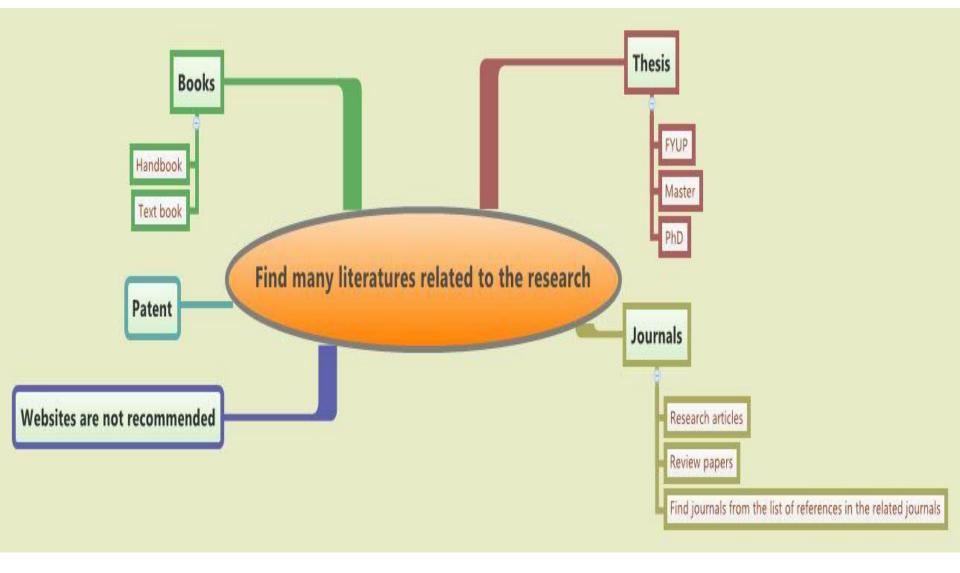


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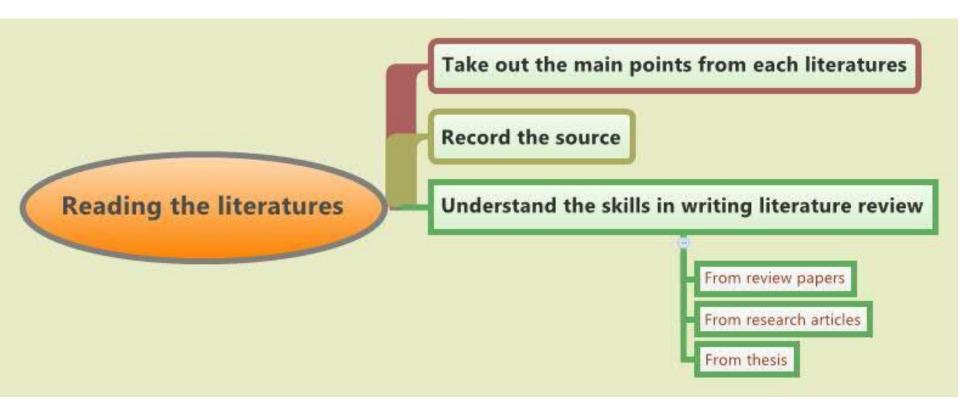


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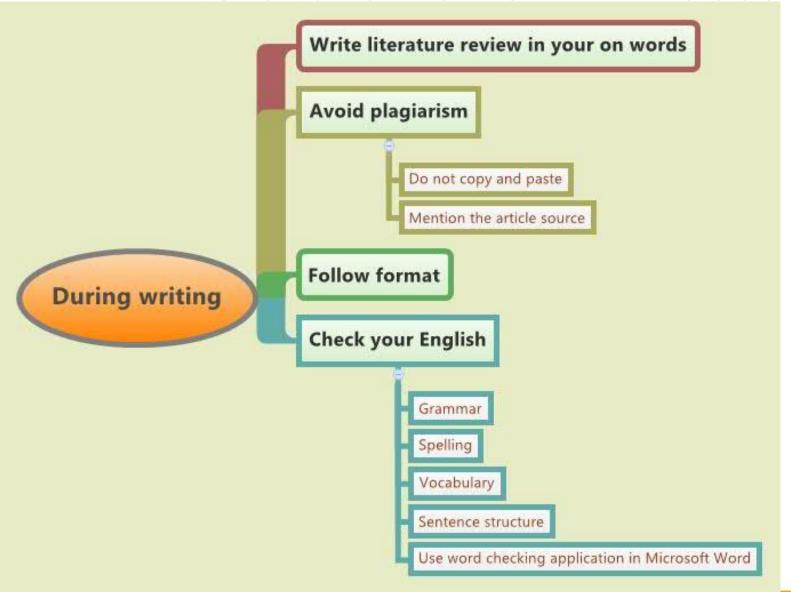


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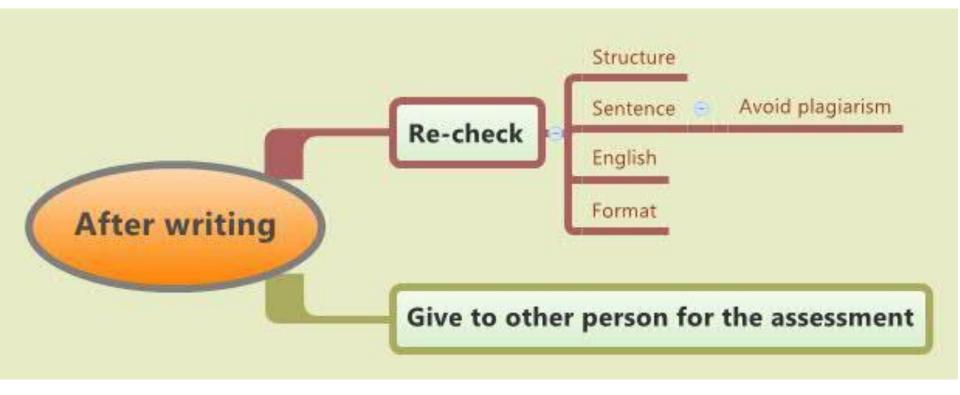


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