

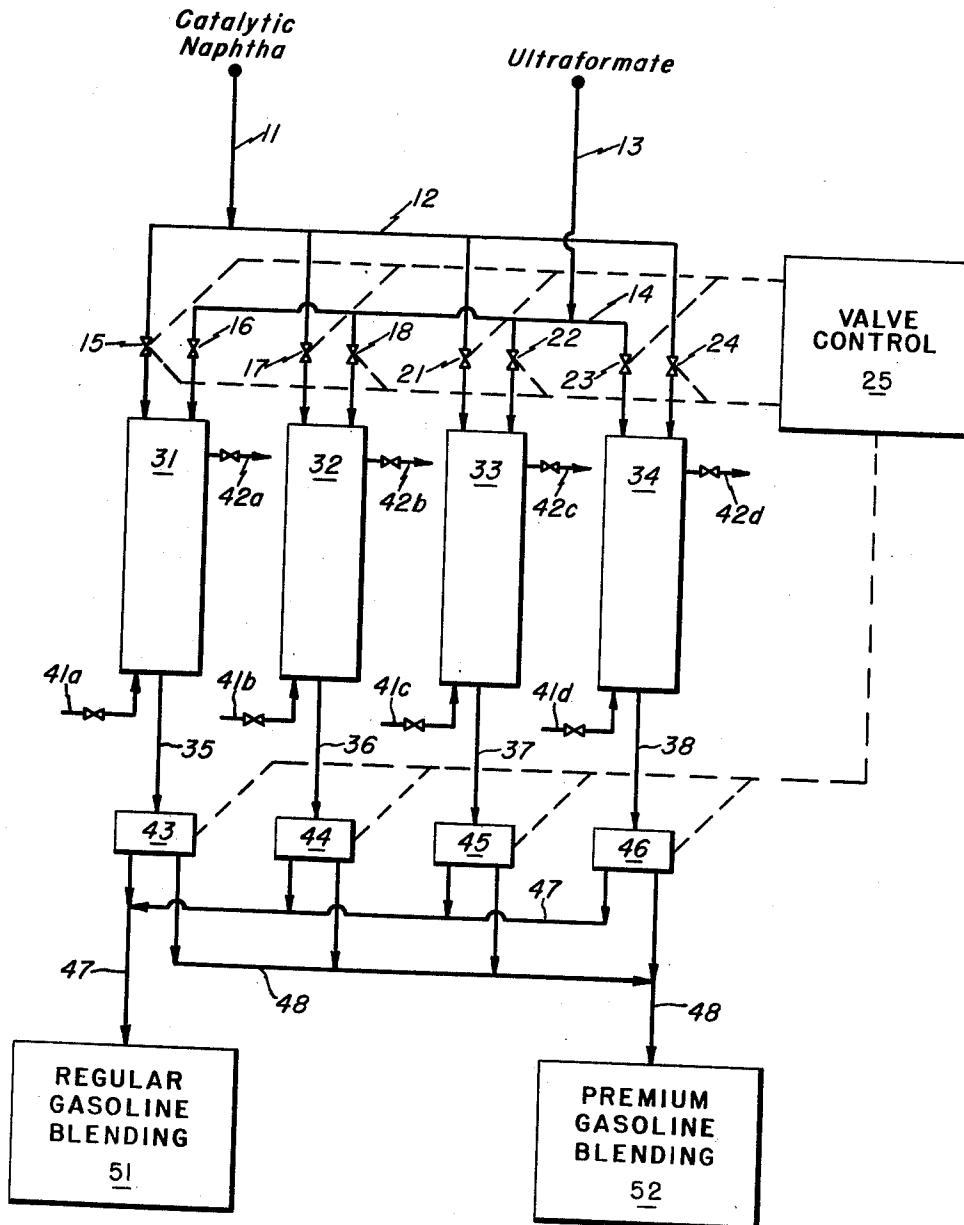
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TRANSFERRING SULFUR BETWEEN GASOLINE POOL COMPONENTS

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POOL COMPONENTS

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This invention relates to a method of improving the quality of gasoline blending stocks. In particular it relates to a method of balancing the organo-sulfur contents of gasoline blending stocks in a refinery gasoline pool. In a more particular aspect, this invention relates to a method of enhancing the lead susceptibility of a blended gasoline containing an organo lead octane improver.

Organo-sulfur compounds are present in many gasoline blending stocks. Such organo-sulfur compounds normally predominate in mercaptans and also may include thiophene, thioethers and even traces of hydrogen sulfide. Examples of blending stocks containing such organo-sulfur compounds are catalytically cracked naphthas, virgin naphthas, condensation by-products from high-temperature cracking of hydrocarbons to make ethylene, etc. Organo-sulfur compounds decrease the blending octane of a blending stock. In fact, the presence of organo-sulfur compounds actually decreases the octane number of the blending stock. Further, where the blending stock is to be used in the presence of an organo lead anti-knock agent, e.g. tetraethyl lead, the presence of organo-sulfur compounds adversely affects the lead susceptibility of the blended gasoline. Thus, when an organo lead anti-knock agent is used in the gasoline, it is difficult to attain full advantage of the anti-knock agent since the adverse effects on blending octane and on lead susceptibility are particularly troublesome where the blending stock is to be used in a leaded gasoline. The problems of blending octane and/or lead susceptibility are not appreciable or not even present in the blending of either non-leaded (including higher and lower octane unleaded) or lower octane leaded gasolines. Therefore, it is advantageous to decrease the effect of the organo-sulfur compounds present in the blending stocks.

In order to maintain gasolines of specific quality refiners provide specifications for finished gasolines which include maximum sulfur contents for the different gasolines produced. The blending stocks used in blending the specific gasolines contain differing amounts of organo-sulfur as a result of either differences in refining techniques or differences in the organo-sulfur content of the crude oil used for obtaining the specific blending stocks. There are many factors which a refiner must consider in utilizing the blending stocks available to him for blending specific gasolines such as those that are called "premium" and "regular." The blending stocks available to the refiner are called the "gasoline pool." Other considerations in the blending of finished gasolines can cause a finished gasoline to be substantially lower in organo-sulfur content than the maximum specification established for such gasoline, while specific blending stocks used for other finished gasolines may contain higher amounts of organo-sulfur than the specification requirement. Thus it is to the refiner's advantage to balance the sulfur contents of the blending stocks in the refinery pool. While methods are available for reducing the sulfur content of blending stocks by ordinary refining means, these methods are expensive and can be quite complicated. Thus it is to the refiner's advantage if a method is available for switching organo-sulfur compounds from the blending stock having more than the specification amount to a blending stock having less than the specification amount.

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We have discovered that the effect of the organo-sulfur compounds in a gasoline blending stock for use in finished gasolines is materially reduced by contacting the gasoline blending stock with a solid adsorbent material capable of selectively adsorbing the organo-sulfur compounds. The resulting blending stock has an increased blending octane and improved lead susceptibility. The adsorbent material containing the adsorbed organo-sulfur compounds is then desorbed with another blending stock for use in another blended gasoline where the organo-sulfur content is not critical. The second blending stock is recovered as a blending stock of increased sulfur content but without materially decreased blending octane. The second blended gasoline, for use in which the second blending stock is intended can be either a non-leaded gasoline in which lead susceptibility problems do not exist or a leaded gasoline which is to be blended from stocks containing sufficient sulfur to materially affect lead susceptibility. Thus, the organo-sulfur compounds have, in effect, been transferred from a first blending stock for use in a first gasoline to a second blending stock for use in a second gasoline without materially affecting blending octane and/or lead susceptibility of the second blending stock or second blended gasoline while balancing the organo-sulfur contents of both blending stocks.

When used herein, the term "non-premium" is a relative term denoting that the blending stock or gasoline modified is a blending stock for a non-premium gasoline or is a non-premium gasoline. The non-premium gasolines are those gasolines normally referred to in the trade as "regular" gasolines and have a lower octane number than the "premium" gasoline.

It has been found that the sulfur content of a gasoline will materially decrease the octane number and/or lead susceptibility of the gasoline as the organo-sulfur content increases at low levels of sulfur concentration. However, in accordance with this invention, as the level of sulfur concentration increases, the effect of the organo-sulfur compounds decreases and is not material at the low sulfur levels of some gasoline blending stocks, e.g. at a sulfur level above about 0.01 weight percent. Thus, any decrease in sulfur content at lower sulfur concentrations materially increases the octane number and/or lead susceptibility of a blending stock while increases in sulfur content at higher sulfur concentration does not materially decrease the blending octane and/or lead susceptibility. Additionally, increase in sulfur content of a non-leaded gasoline does not materially effect blending octane.

More particularly, the method of this invention may be used for enhancing lead susceptibility of a leaded gasoline by transfer of sulfur from that gasoline or component thereof to another gasoline or component thereof. The contacting or adsorption step may advantageously be carried out at a temperature as low as 0° F. but below the boiling point of the blending stock charged to the contacting step. The preferred adsorption temperature range is from about 65 to about 100° F. It has been found that it is advantageous to charge the blending stock through a bed of adsorbent material at a space velocity of from about 0.1 to about 4.5 cubic feet per cubic foot of adsorbent per hour. Of course, higher space velocities may be used if desired. The preferred space velocity is about 3 cubic feet per cubic foot of adsorbent per hour.

Desorption is preferably carried out in the same direction of flow through the adsorbent bed as is the flow during the adsorption step. Normally, other conditions being equal, a greater amount of desorption fluid is necessary for substantial desorption of the organo-sulfur compounds than the amount of blending stock used during the adsorption step. Thus, at least about two volumes of desorption fluid may conveniently be used in an iso-

thermal adsorption-desorption operation per volume of blending stock used during the adsorption step. If lesser amounts of desorption fluid are used, the desorption temperature should be raised above the temperature of adsorption; however, desorption is also carried out in the liquid phase.

In a particular embodiment of this invention, at least three beds of adsorbent material are utilized. While a first bed is being charged with a first blending stock for removal of sulfur, a second and third bed are each being desorbed with desorption fluid, i.e. another blending stock, to remove organo-sulfur compounds deposited from a previous adsorption step. The first blending stock and desorption fluid are alternated among the beds so as to provide continuous adsorption and desorption, one bed undergoing adsorption while two alternate beds are undergoing desorption. A fourth alternate bed may conveniently be provided for purposes of regeneration. Accordingly, when it becomes necessary to regenerate the adsorbent material in one on-stream bed, the bed is taken off stream and the fourth bed is placed on stream in lieu thereof. The bed taken off stream may conveniently be regenerated by contacting with hot inert regeneration gases, such as hydrogen, nitrogen or flue gas, at a temperature in the range of from about 300° F. to about 600° F.

If desired, in the case of nitrogen or flue gas, after purging, oxygen may be included in the inert gas, i.e. up to 2% oxygen, to burn off any residual matter on the adsorbent material.

The blending stock used as a feed to the adsorption step is a blending stock containing organo-sulfur compounds. The blending stock is one which is to be used as a blending stock for a leaded gasoline. Examples of such blending stocks are virgin naphthas and catalytic naphthas such as light and heavy catalytic debutanized adsorption naphthas. Other organo-sulfur-containing blending stocks may be used.

The desorption fluid is also a gasoline blending stock, but for use in either a non-leaded gasoline or in a leaded gasoline which contains or is to be blended to contain a sufficient amount of sulfur to materially decrease lead susceptibility so that the additional amount of sulfur desorbed from the adsorbent material will not further significantly decrease the lead susceptibility of the gasoline blended from the desorbate stock. The desorption fluid is preferably non-sulfur containing, i.e. contains little or no organo-sulfur compounds. Examples of such blending stocks are hydroformed naphthas such as an Ultraformate obtained as the effluent from the catalytic reforming of naphthas at low pressures in the presence of hydrogen and a platinum reforming catalyst, etc. Examples of other desorption fluids are polymer gasoline, toluene, light ends of a C₇ and higher reformat cut, light reformat fraction (cut point at about 300° F. or lower) or other aromatics fractions especially predominating in toluene; still other examples are isomerized saturated or unsaturated pentanes, pentane fractions distilled from virgin naphtha reformer feed, etc. Fractions predominating in light aromatics such as benzene and toluene are preferred as desorption fluids. However, some loss of aromatics content should be expected during desorption by adsorption of aromatics by the adsorbent. Adsorbed aromatics are desorbed into the next sulfur-containing feed stream and are not lost from blending stock although they are in effect transferred from the desorption fluid to the other blending stock. Such transfer of aromatics may result in a blending octane loss to the desorption fluid and a blending octane gain to the feed blending stock. Thus, in the preferred embodiment the desorption fluid contains predominately light aromatics and is a blending stock for non-premium gasoline while the feed from which sulfur is removed is a blending stock for premium gasoline; if aromatics transfer occurs, such transfer is then from non-premium to premium blending stocks. The desorption fluid may also

be of the same type of blending stock used during adsorption; however, in such cases the desorption step should be carried out at a higher temperature than the adsorption step to assure desorption of organo-sulfur compounds.

The adsorbent materials are those adsorbents which have a higher selectivity for organo-sulfur compounds than for hydrocarbons. Such adsorbents are well known to the art; some examples are silica gel, alumina, synthetic zeolites such as molecular sieves having 13 Å. pore sizes, bauxite, activated carbon, silica-alumina, etc. The preferential selectivity of such materials for organo-sulfur compounds permits adsorption of organo-sulfur compounds without substantial adsorption and resulting transfer of hydrocarbon components. However, because such adsorbent materials also often exhibit a certain amount of selectivity to aromatic hydrocarbons over non-aromatic hydrocarbons, some of the aromatic hydrocarbons will be transferred from the fluid of high aromatic content to the fluid of lower aromatic content. Thus, in a particularly preferred operation of this process, the desorption fluid is a non-premium blending stock which has a higher aromatic hydrocarbon content than does the blending stock from which sulfur is adsorbed and the latter blending stock is a blending stock for premium gasoline so that any inadvertent transfer of hydrocarbons would increase the aromatic content of premium blending stock rather than the non-premium blending stock. The increased aromatic content may further increase blending octane of the premium stock.

In any embodiment in accordance herewith, based on the amount of blending stock to be charged through the adsorbent bed during adsorption, it is preferred to use at least two volumes of adsorbent material to obtain 90% desulfurization of the blending stock and, in addition, at least two volumes of desorption fluid to increase the percentage desulfurization up to 99% or more.

The figure is a schematic flow diagram of an embodiment of this invention.

With reference to the figure, a catalytic naphtha (catalytic debutanized adsorption naphtha) is charged through line 11 and valve 15 to adsorber 31. The catalytic naphtha is a premium gasoline blending stock containing organo-sulfur compounds and is obtained from the catalytic cracking of gas oil. Adsorber 31 contains a bed of silica gel adsorbent and as the catalytic naphtha passed downward therethrough, organo-sulfur compounds are adsorbed. Analyzer 43 is a dielectric constant analyzer and is used to analyze the catalytic naphtha withdrawn from adsorber 31 through line 35. Catalytic naphtha of decreased sulfur content is discharged from adsorber 31 through line 35. During discharge of catalytic naphtha of decreased sulfur content, analyzer 43, provided with a valve mechanism, diverts the discharge through line 48 to premium gasoline blending pool 52. When sulfur breaks through in line 35, as detected by analyzer 43, valve 15 is closed and valve 17 is opened to switch the catalytic naphtha feed from adsorber 31 to adsorber 32. A low sulfur-containing highly-aromatic Ultraformate is then charged through line 13 and valve 16 through adsorber 31 to desorb the organo-sulfur compounds. Analyzer 43 now diverts the discharge from adsorber 31 through line 47 to regular gasoline blending pool 51. In the meantime, the adsorption process in adsorber 32 takes place in the same manner as the previous adsorption in adsorber 31 with discharge through line 36 being diverted by analyzer 44 through line 48 to premium gasoline blending pool 52 until sulfur breakthrough whereupon valve 17 is closed and valve 21 is opened. Valve 18 is then also opened for desorption of adsorber 32 with ultimate discharge through line 47 to regular gasoline blending pool 51. The adsorption is repeated in adsorber 33 until sulfur breakthrough and the valves 21 and 16 are closed and valve 15 is opened to repeat the adsorption step in adsorber 31. Valve 22 is opened and adsorber 33 is desorbed in the

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same manner as adsorber 31. Thus, while one adsorber is being used for adsorption of organo-sulfur compounds from catalytic naphtha continuously charged through line 11, two other adsorbers are being desorbed with Ultraformate charged through line 13. Space velocity for all chargings is about 3.0 cubic feet of feed per cubic foot of silica gel per hour. Valve control 25 is provided for control of the inlet valves of the adsorbers for alternating charging of catalytic naphtha and Ultraformate. Analyzers 43, 44 and 45 detect the presence of organo-sulfur compounds for control of the inlet valves through valve control 25 and also differentiate between catalytic naphtha and Ultraformate being discharged from each adsorber so that the discharge may be directed to the appropriate blending pool.

Adsorber 34 is provided to permit regeneration of one adsorber while three adsorbers are still on stream. Each adsorber is provided with a valved regeneration gas inlet, i.e. valved lines 41a, 41b, 41c and 41d, and a regeneration gas outlet, i.e. valved lines 42a, 42b, 42c and 42d. Regeneration is accomplished by passing hydrogen at a temperature of about 450° F. into inlet 41 of the adsorber to be regenerated and venting the regeneration gas from valved line 42 of the appropriate adsorber. Regeneration of the illustrated system is advantageously carried out after about 100 adsorption-desorption cycles in each adsorber.

The analyzer with which each adsorber is equipped, i.e. analyzers 43, 44, 45 and 46, were dielectric constant analyzers in the above flow. However, other analyzers known to the art may be used. For example, a refractive index analyzer may conveniently be employed to differentiate components discharged from the adsorbers. Also, in lieu of an analyzer, a cycle timer may be provided to permit adsorption for a preselected or predetermined

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butanized adsorption naphtha was treated as follows: 500 ml. of the naphtha were percolated through 1000 ml. of silica gel followed by 1000 ml. of Ultraformate. The gel bed was used for 33 cycles of alternating naphtha and Ultraformate. In the 34th cycle, the octane numbers of the naphtha and Ultraformate, both percolated and unpercolated, were determined. In addition, the octane numbers of premium gasoline blends containing both percolated and unpercolated naphtha and regular gasoline blends containing both percolated and unpercolated Ultraformate were also determined. Further, the percentage sulfur in all of these blending stocks and in the blended gasolines were also determined. The sulfur determinations are reported below in Table I.

TABLE I

Sulfur determinations

Component:	Percent sulfur
Debutanized naphtha without sulfur exchange	0.071
Debutanized naphtha with sulfur exchange	0.0042
Ultraformate without sulfur exchange	0.0006
Ultraformate with sulfur exchange	0.029
Premium gasoline blend ¹ without sulfur exchange	0.023
Premium gasoline blend ¹ with sulfur exchange	0.0016
Regular gasoline blend ² without sulfur exchange	0.077
Regular gasoline blend ² with sulfur exchange	0.089

¹ Containing 30% catalytic debutanized naphtha.

² Containing 33% Ultraformate.

The octane numbers (an average of several determinations) were as reported in Table II.

TABLE II
OCTANE NUMBERS CLEAR

	Debutanized naphtha		Ultraformate		Premium blend		Regular blend	
	Untreated	Percolated	Untreated	Percolated	Untreated naphtha	Percolated naphtha	Untreated Ultraformate	Percolated Ultraformate
Research octane.....	92.95	92.50	97.10	97.00	95.76	95.67	88.90	88.90
Motor octane.....	78.90	79.43	86.35	85.85	85.56	85.24	79.77	79.17
Average of research and motor octane.....					90.66	90.46	84.34	84.04

OCTANE NUMBERS WITH 3 CC. TEL ADDED

	98.30	98.70	101.88	100.88	101.82	102.21	96.80	96.77
Research octane.....								
Motor octane.....	84.40	86.35	90.97	89.50	91.89	92.73	85.76	85.75
Average of research and motor octane.....					96.86	97.47	91.28	91.26

period of time and desorption for a predetermined period of time.

In the flow described above with reference to the figure, the adsorbers each have an inner diameter of 5 feet and a length of 40 feet of bed. Each adsorber contains 36,000 pounds of 60-200 mesh silica gel. The catalytic naphtha is charged through line 11 at a continuous rate of 6600 barrels per day and the Ultraformate is continuously charged through line 13 at a rate of 13,000 barrels per day. The valves are manipulated to alternate the flow through the adsorbers as described above. Desulfurized catalytic naphtha is continuously withdrawn through line 48 and charged to premium gasoline blending. Ultraformate containing an increased amount of organo-sulfur compounds desorbed from the adsorbent is continuously withdrawn through line 47 and charged to regular gasoline blending.

In order to more fully demonstrate the operation of the process of this invention, about 600 ml. of catalytic de-

From the data reported in Table I, it is evident that the sulfur was transferred from the naphtha to the Ultraformate and that the sulfur content of the regular gasoline blend was increased while the sulfur content of the premium gasoline blend was decreased.

Table II includes the octane numbers for both clear and leaded gasolines or clear and leaded blending stocks. The leaded gasolines and blending stocks contain 3 cc. of tetraethyl lead per gallon. Both research and motor octane numbers are reported for the blending stocks and gasoline, and the average of research and motor octane numbers is reported for the blended gasolines. The blended gasolines were of the same composition as those reported in Table I.

The changes in octane number resulting from the sulfur transfer are given below in Table III. The octane number changes were determined differentially making comparison between the percolated and unpercolated blending stocks or blended gasolines.

TABLE III
Octane number changes

	Clear		+3 cc. TEL	
	Research	Motor	Research	Motor
Debutanized naphtha...	-0.67	-0.13	+0.35	+1.92
Ultraformate.....	-0.10	-1.31	-1.01	-1.47
Premium blend.....	-0.09	-0.32	+0.39	+0.84
Regular blend.....	0.0	-0.61	-0.03	-0.04

The most important octane number changes occurred in the premium and regular gasoline blends containing tetraethyl lead. The premium blend showed an average research and motor octane advantage of 0.61 while the regular gasoline blend suffered essentially no average research and motor octane disadvantage in spite of the increase in sulfur content from 0.077 to 0.089. Thus, it is evident that the sulfur transfer has resulted in an improved premium gasoline or premium gasoline blending stock without materially affecting the regular gasoline or regular gasoline blending stock. The method of this invention improves lead susceptibility of the premium gasoline blend toward organo-lead anti-knock agents without materially detracting from the lead susceptibility of the regular gasoline blend.

In order to compare the sulfur content of a premium gasoline prepared from a blending stock processed in accordance herewith, sulfur content of a number of commercial premium blends was determined as reported in Table IV below:

TABLE IV

Commercial premium gasoline:	Sulfur wt. percent
A	0.008
B	0.013
C	0.015
D	0.015
E	0.010
F	0.030
G	0.012
H	0.010
J	0.004
K	0.008
L	0.005
M	0.005
Average	0.011

A premium gasoline blended from components not treated in accordance herewith had a sulfur content of 0.023 while a like blend wherein the debutanized naphtha fraction was treated in accordance herewith had a sulfur content of 0.0016%. This demonstrates the change in sulfur content and the blended premium gasoline obtained as a result of this invention compares very favorably with the commercial blends listed in Table IV with regard to sulfur content.

As another example of this invention, sulfur was transferred from a heavy naphtha containing 0.364 wt. percent sulfur and 45% aromatics to a heavy Ultraformate. The heavy naphtha is to be used as a blending stock for a leaded regular gasoline and the blended leaded gasoline, using the heavy naphtha without sulfur removal, would have near the maximum allowable sulfur content. The heavy naphtha is the principal contribution of sulfur to the blended regular leaded gasoline and its transfer from the heavy naphtha is desirable. The desorbent fluid is a heavy Ultraformate which is to be used as a blending stock for an unleaded premium gasoline. Accordingly, sulfur transfer was carried out by alternating the heavy naphtha and heavy Ultraformate through adsorbent material, each charging of both heavy naphtha and heavy Ultraformate constituting one cycle. In each cycle, 500 ml. of heavy naphtha were charged through 1000 ml.

silica gel (grade 950) followed by 1000 ml. heavy Ultraformate charged in the same direction. The amounts of product recovered and the sulfur content of each product are set out in Table V below:

TABLE V

Cycle	Volume, ml.		Sulfur content, weight percent	
	Heavy naphtha	Heavy Ultraformate	Heavy Naphtha	Heavy Ultraformate
1.....	371	883	0.126	0.117
2.....	525	840	0.087	0.128
3.....	550	940	0.108	0.117
4.....	510	1,030	0.085	0.129
5.....	490	1,000	0.125	0.107
6.....	490	990	0.126	0.107
7.....	500	975	0.106	0.115
8.....	470	1,030	0.077	0.076
9.....	490	970	0.138	0.112
10.....	450	-----	0.082	-----

In the ten cycles, an average of more than 70% of the sulfur was removed from the heavy naphtha. Transfer of aromatics also undoubtedly occurred between the two stocks.

It is evident that we have provided a method for improving lead susceptibility and blending octane of blending stocks by transferring sulfur to another blending stock while not materially adversely affecting the lead susceptibility and blending octane of the other blending stock. The resulting gasoline blend having sulfur removed is improved without materially detracting from the resulting other gasoline blend.

This application is a continuation-in-part of application Serial No. 62,412, filed October 13, 1960 by Herman S. Seelig, John R. Coley and Harry M. Brennan, now abandoned.

Having thus described our invention, we claim:

1. A method of improving the lead susceptibility and blending octane of a sulfur-containing gasoline blending stock for use in leaded gasoline, which method comprises contacting said blending stock in the liquid phase with a solid adsorbent material capable of selectively absorbing organo-sulfur compounds, desorbing said adsorbent material with a second gasoline blending stock, recovering said second blending stock from said desorbing as a blending stock of increased sulfur content without material decrease in blending octane, and recovering the first blending stock from said contacting as a blending stock having increased lead susceptibility and blending said stocks into finished gasolines without additional sulfur removal from either of said stocks.

2. A method for enhancing the lead susceptibility and octane blending number of a sulfur-containing first gasoline blending stock, which method comprises passing said first blending stock in the liquid state at a temperature above 0° F. and below the boiling point of said first blending stock through a bed of solid adsorbent material capable of selectively adsorbing organo-sulfur compounds whereby organo-sulfur compounds are adsorbed from said first blending stock, recovering treated first blending stock after adsorption of organo-sulfur compounds therefrom as a gasoline blending stock of enhanced lead susceptibility and octane blending number, thereafter passing a sufficient amount of a second gasoline blending stock through said bed to desorb adsorbed organo-sulfur compounds from said adsorbent material, recovering treated second blending stock containing desorbed organo-sulfur compound as a second gasoline blending stock substantially unchanged with respect to lead susceptibility and octane blending number, and alternating the two passing steps whereby said first and second gasoline blending stocks are alternately passed through said bed and organo-sulfur compounds are transferred from said first blending stock to said second blending stock and said treated blending stocks are ob-

tained as separate products and blending said stocks into finished gasolines without additional sulfur removal from either of said stocks.

3. The method of claim 2 wherein said adsorbent material is silica gel.

4. The method of claim 2 wherein at least two volumes of adsorbent material and said second blending stock are used per volume of said first blending stock contacted.

5. The method of claim 2 wherein both said passing steps are at a rate of from 0.1 to about 4.5 cubic feet of blending stock per cubic foot of adsorbent material.

6. A process for transferring organo-sulfur compounds from a relatively high sulfur-containing first gasoline blending stock to a lower sulfur-containing second gasoline blending stock whereby the lead susceptibility and blending octane number of said first stock are enhanced without materially adversely affecting the lead susceptibility and blending octane number of said second stock, which process comprises alternately flowing, at a temperature above 0° F. and below about 300° F. at space velocities in the range of 0.1 to 4.5 cubic feet per cubic foot of adsorbent material per hour, said first gasoline blending stock and said second gasoline blending stock in the liquid state through each of a plurality of contacting zones containing adsorbent material capable of selectively absorbing organo-sulfur compounds whereby organo-sulfur compounds are alternately adsorbed from said first stock by said adsorbent material and are desorbed from said adsorbent material into said second stock, controlling said flowing to provide flow of said first stock through one of said plurality of zones for adsorption of organo-sulfur compounds therefrom simultaneous with flow of said second stock through another of said plurality of zones for desorption of organo-sulfur compounds from the adsorbent material therein, and alternately recovering from each contacting zone a first product consisting of a relatively low sulfur-containing gasoline blending stock having enhanced lead susceptibility and blending octane and a second product consisting of a relatively high sulfur-containing gasoline blending stock substantially unaffected with respect to lead susceptibility and blending octane and blending said stocks in finished gasolines without additional sulfur removal from either of said stocks.

7. The process of claim 6 wherein said temperature is in the range of from 65 to 100° F.

8. A process for transferring organo-sulfur compounds

from a relatively high sulfur-containing first gasoline blending stock to a lower sulfur-containing second gasoline blending stock whereby the lead susceptibility and blending octane number of said first stock are enhanced without materially adversely affecting the lead susceptibility and blending octane number of said second stock, which process comprises sequentially charging said first stock through a first contacting zone, a second contacting zone and a third contacting zone, each of said contacting zones containing silica gel adsorbent material, each sequential charging of said first stock through each zone being in an amount sufficient to provide less than about one volume of said first stock per two volumes of said silica gel in each of said contacting zones, while charging said first stock through each of said contacting zones simultaneously charging through the other two of said contacting zones at least two volumes of said second stock per volume of said first stock previously charged therethrough, each charging of said first stock and said second stock being at an hourly space velocity of about 3 cubic feet per cubic foot of silica gel and at a temperature in the range of from 65° F. to 100° F., during said sequential chargings of said first stock through each contacting zone recovering from each contacting zone a first product consisting of a low sulfur-containing first gasoline blending stock having enhanced lead susceptibility and blending octane, and during the charging of said second stock through said other two contacting zones recovering therefrom a second product consisting of a high sulfur-containing gasoline blending stock not materially decreased in lead susceptibility and blending octane and blending said products into finished gasolines without additional sulfur removal from either of said products.

9. The process of claim 8 wherein one of said three contacting zones is replaced on stream with a fourth contacting zone containing silica gel adsorbed material and the replaced zone is regenerated by passing hot hydrogen gas therethrough at a temperature in the range of from about 300° F. to about 600° F.

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