Title: A PROCESS FOR PREPARING A TEA PRODUCT

Abstract: A process for preparing a tea product characterized in that the process comprises the steps of: a. contacting tea leaf with a gas phase to obtain aroma-laden gas phase, said gas phase comprising less than 30 g water vapour per kg of the gas phase on dry basis, and b. recovering aroma from the aroma-laden gas phase by subjecting the aroma-laden gas phase to: i. a step of condensation to obtain an aroma condensate, optionally to a further step of concentrating the aroma condensate to obtain an aroma concentrate, or ii. a step of contacting with an adsorbent, optionally to a further step of desorption; wherein and the ratio of water to dry mass of tea leaf is less than 5 during the step (a), and the step (b) is prior to a step of deactivation of enzymes in the tea leaf.
A PROCESS FOR PREPARING A TEA PRODUCT

TECHNICAL FIELD

5 The invention relates to a process for preparation of a tea product.

BACKGROUND OF THE INVENTION

There are many forms of tea products available in the market. These include black tea, green tea, oolong tea, ready-to-drink tea and hot instant or cold instant tea powder and a host of other tea blends tailored to specific consumer requirements.

Black tea is generally prepared by the process which includes the steps of withering, macerating, fermenting and firing/drying. The characteristic colour, flavour and aroma of black tea is produced during fermentation. The term fermentation is traditionally used in the tea processing to refer to enzymatic oxidation. The tea is dried at high temperature after fermentation to arrest the enzyme action and to bring down the moisture to a low level. Oolong tea is a type of tea which is taken through the same process steps as that used for preparing black tea except that the step of fermentation is only partially completed. Green tea is generally prepared by heat treating (e.g. by steaming or pan-frying) freshly plucked leaves to arrest enzyme action and then subjecting the leaves to one or more steps of rolling and drying. Ready-to-drink tea is another format where tea beverage which is ready to be consumed is packed in a can, or any other suitable container. Alternately, ready-to-drink tea is also dispensed from vending machines where tea may be prepared from leaves or water soluble tea powders in the machine wherefrom it is dispensed into cups for consumption. More recently, tea has also been made available in a hot-instant or cold-instant tea format. In this format, the hot water soluble fractions or the cold water soluble fractions of tea leaves (either green, black or oolong tea) are dried into a solid form. The consumer just needs to add water at desired temperature to these tea formats to prepare the beverage of his or her choice. Generally manufacturers blend the hot-instant or cold-instant tea with other formulating
ingredients like milk powder, sugar, flavours like lemon, peach, cardamom etc to sell various types of these instant tea to meet the requirements of varied consumers.

There are many organoleptic properties of tea beverage which have to blend very smoothly with each other in order to meet the varied as well as specific consumer needs. These include aroma, taste, flavour, bitterness, astringency among a host of other properties. One of the most important properties which gives the tea drinker an initial attractive impact even before the beverage is prepared is the aroma of tea. Equally important is the perception of tea aroma by the tea drinker during the preparation of tea by boiling and during drinking. Thus, tea manufacturers have been trying to provide tea products with better and better aroma impact. One way this has been done is by adding synthetic or nature identical aroma compounds to the tea product by external blending. Another way has been by recovering the volatile aroma compounds evolved during the high temperature processing step viz. the drying step of the black tea manufacturing process.

An example of this is described in UK patent application GB1209055 (Tenco Brooke Bond, 1970) where fermented but unfired tea (dhool) is steamed, preferably under reduced pressure, to recover a steam-vapour mixture which is condensed to form a distillate containing most of the volatile flavour components, where distillate may be concentrated or the essential oils recovered therefrom. The steamed dhool is then fired and extracted to give a concentrate of soluble solids, for example with water, and preferably under an inert atmosphere. The steam distillate (or its concentrate or oil) is blended with the fired dhool extract (which may have been extracted together with the fired dhool), which extracts may have been concentrated, and the mixture may be freeze dried or spray dried to give an instant tea. The specific process exemplified in the above document is by contacting dhool with steam in steamer at pressure of 280 Torr and temperature of vapour issuing from steamer is about 70 °C. Such a process involves an additional steaming step after fermentation and increases the overall processing time and necessitates capital expenditure for investing in additional steamer equipped with vacuum. Secondly, the resulting aroma is relatively poor in fresh notes.
Another way the volatile aroma compounds in the tea have been recovered and utilised is described in GB1117102 (Nestle, 1968) where comminuted unfermented fresh tea is suspended in a liquid, and at least a part of the aromatics is stripped from the solution, for example under reduced pressure at about 60 °C., and recovered, and soluble matter is then extracted from the tea to provide an extract. The suspension may be fermented prior to extraction, if desired, during the stripping, preferably at 20-60 °C. The examples indicate a process where leaf is mixed with water to prepare a suspension having 4-5% total solids followed by stripping. In such a process a large quantity of water and/or solvent is condensed together with the aroma volatiles, which necessitates further processes of separation of the water/solvent. In addition, such a process requires additional equipment such as thin film evaporator and can not be used in the conventional processing. Furthermore, the fresh leaf which is subjected to such a process can not be used further to obtain further tea products such as black tea or oolong tea having properties of conventional black or oolong tea.

WO 2009/083420 (Unilever) discloses a process for recovering aroma compounds from a tea material by contacting the tea material with water or water vapor.

In some of the processes there is a modification in the usual process of tea manufacture which tends to change the properties of the tea produced. In other cases where volatile aroma compounds are recovered from the dryer exhaust which is very lean in these volatile aroma compounds, one needs to resort to expensive recovery methods and use specialised equipment which tends to make the process economically unattractive.

It is an object of the present invention to overcome or ameliorate at least one of the disadvantages of the prior art or to provide a useful alternative.

It is another object of the present invention to obtain a tea product that has relatively high fresh notes.
It is another object of the present invention to provide for a process to prepare a tea product where the process comprises a step of recovery of volatile aroma compounds in good yield and quality from the tea leaf.

It is another object of the present invention to be able to recover aroma during the processing of tea leaf without compromising on the quality of the tea product that may be further obtained from the tea leaf.

It is another object of the present invention to provide for a process to recover volatile aroma compounds from a traditional tea manufacturing process where the recovered aroma compounds are produced in good yield and quality such that it can be added back to any tea product to enhance the aroma impact of that product.

SUMMARY OF THE INVENTION

According to the first aspect of the present invention there is provided a process for preparing a tea product characterized in that the process comprises the steps of:

a. contacting tea leaf with a gas phase to obtain aroma-laden gas phase, said gas phase comprising less than 30 g water vapour per kg of the gas phase on dry basis, and;

b. recovering aroma from the aroma-laden gas phase by subjecting the aroma-laden gas phase to:
   i. a step of condensation to obtain an aroma condensate, optionally to a further step of concentrating the aroma condensate to obtain an aroma concentrate, or;
   ii. a step of contacting with an adsorbent, optionally to a further step of desorption

wherein and the ratio of water to dry mass of tea leaf is less than 5 during the step (a), and the step (b) is prior to a step of deactivation of enzymes in the tea leaf.

According to a second aspect of the present invention there is provided a black tea or oolong tea comprising the aroma condensate or the aroma concentrate or the
desorbed aroma of the first aspect where the material separated from the adsorbent during the desorption is termed as desorbed aroma. The aroma condensate or the aroma concentrate or the desorbed aroma is preferably from 0.01-10% by weight, more preferably in the range of 0.1 to 5% by weight of the black tea.

According to a third aspect of the present invention there is provided a ready-to-drink tea comprising the aroma condensate or the aroma concentrate or the desorbed aroma of the first aspect. The aroma condensate or the aroma concentrate or the desorbed aroma is preferably from 0.01-10% by weight, more preferably 0.01 to 5% by weight of the ready-to-drink tea.

**DETAILED DESCRIPTION OF THE INVENTION**

"Tea" for the purposes of the present invention means material from *Camellia sinensis* var. *sinensis* or *Camellia sinensis* var. *assamica*. It also includes rooibos tea obtained from *Aspalathus linearis*. "Tea" is also intended to include the product of blending two or more of any of these materials.

The tea product produced by the process of this invention may be fermented tea (i.e. black tea), or semi-fermented tea (i.e. oolong tea).

By "ready-to-drink tea" is meant a beverage comprising tea solids. Ready-to-drink tea usually has a water content of at least 80%, optimally between 85 and 99.9% by weight. Ready-to-drink tea may be packaged in an air tight container such as a can or bottle. The tea solids content of ready-to-drink tea is typically in the range of 0.001 to 5% by weight, preferably 0.01 to 3% by weight and most preferably 0.1 to 1% by weight.

The term tea leaf as used herein includes leaves and stem of the tea plant. Preferably, the tea leaf comprises actively growing buds, e.g. in the form of the first two or three leaves together with the unopened bud (so-called "two-leaf-and-a-bud" or "three-leaf-and-a-bud" material). The fresh tea leaf may first be withered for about 12
to 36 hours. Biochemical and/or chemical changes taking place during withering may increase the yield of the volatile flavour compounds in tea.

Both comminuted as well as uncommminuted tea leaf may be used. However, the tea leaf is preferably a comminuted tea leaf. Tea leaf is preferably comminuted by maceration. Maceration involves wounding the leaves e.g. by rolling and/or crushing the leaves i.e. to break down the plant tissue structure. The maceration is preferably achieved by passing the tea leaves through a cutting machine. Thus for the purpose of the invention the tea leaves may be macerated by a maceration process using a CTC, rotorvane, ball mill or a grinder or a hammer mill or a Lawri tea processor or a Legg cutting machine or rolled using tea rollers as in orthodox tea processing. Combinations of these maceration processes may also be used. Fresh tea leaf which is withered and macerated is known as dhool.

15 The step (a)

The step (a) involves contacting the tea leaf is with a gas phase. The gas phase preferably comprises oxygen. More preferably the gas phase comprises air.

20 Comminuted as well as uncommminuted tea leaf may be used. However, the tea leaf is preferably a comminuted tea leaf. Tea leaf is preferably comminuted by maceration. Maceration involves wounding the leaves e.g. by rolling and/or crushing the leaves i.e. to break down the plant tissue structure. The maceration is preferably achieved by passing the tea leaves through a cutting machine. Thus for the purpose of the invention the tea leaves may be macerated by a maceration process using a CTC, rotorvane, ball mill or a grinder or a hammer mill or a Lawri tea processor or a Legg cutting machine or rolled using tea rollers as in orthodox tea processing. Combinations of these maceration processes may also be used. Fresh tea leaf which is withered and macerated is known as dhool.

25 The gas phase is at a temperature preferably less than 150 ºC, more preferably less than 120 ºC. The gas phase is preferably at a temperature greater than 5 ºC, more
preferably greater than 20 °C. It is particularly preferred that the gas phase is at a
temperature in the range of 20 °C to 120 °C.

The ratio of water to dry mass of tea leaf is less than 5, more preferably less than 4.5
and further preferably less than 4. If any non-aqueous liquid is present during the step
(a), the ratio of non-aqueous liquid to dry mass of tea is less than 5, more preferably
less than 4. It is particularly preferred that the tea leaf is not contacted with a non-
aqueous liquid.

10 The gas phase comprises less than 30 g water vapour per kg of the gas phase on dry
basis. The gas phase comprises preferably less than 25 g, more preferably less than
20 g and most preferably 15 g water vapour or steam per kg of the gas phase on dry
basis. The amount of water (g) per kg of the gas phase refers to the water vapour
content of the gas phase prior to contacting with the tea leaf. The amount of water
15 vapour (g) per kg of the gas phase may be easily determined by a skilled person from
measurement of relative humidity and temperature.

The contacting of the tea leaf with the gas phase may be carried out in many ways.
The tea leaf may be laid in thin layers onto the floor (typically less than 2 inches thick)
or in deep beds (2 to 10 inches) with gas phase passed upwards through the bed.
Examples of such deep bed contactors include batch units such as troughs & tubs
with perforated mesh support on which tea leaf is put and continuous units comprising
of perforated belts on which tea leaf is layered. The gas phase is pumped upward into
the bed through the perforations. The air ensures availability of oxygen for the
25 reactions happening during fermentation.

Contacting of the tea leaf with the gas phase results into transfer of volatiles liberated
to the gas phase resulting into an aroma-laden gas phase.

30 The gas phase is contacted with the tea leaf at a rate of preferably 0.01 to 50 kg of
the gas phase per kg dry mass of the tea leaf per hour, more preferably 1 to 30 kg of
the gas phase per kg dry mass of the tea leaf per hour, most preferably 2 to 20 kg of
the gas phase per kg dry mass of the tea leaf per hour. It is particularly preferred that
the gas phase is contacted with the tea leaf at a rate of 2 to 15 kg of the gas phase
per kg dry mass of the tea leaf per hour.

5 The step (b)

The step (b) involves recovering aroma from the aroma-laden gas phase. It is
evisaged that the steps (a) and (b) may be sequential or simultaneous, preferably
sequential. It is essential that the step (b) is carried out prior to a step of deactivation
of enzymes. It is particularly preferred that the step (a) is also carried out prior to the
step of deactivation of enzymes.

The aroma-laden gas phase is preferably subjected to a step of condensation to
recover the aroma condensate. Preferably, the aroma-laden gas phase is subjected to
a step of condensation to recover the aroma condensate. For example, the aroma-
laden gas phase may be directed to a condenser and the aroma compounds along
with the water are condensed using a condenser supplied with a coolant at a
temperature of -5° C to 30° C., more preferably in the range of -5 ° C to 20 ° C and
most preferably in the range of -5 °C to 10° C. Alternatively, the aroma-laden gas
phase is compressed to obtain the aroma condensate.

The aroma condensate comprises total organic carbon preferably in the range of 1 to
1000 mg/L, more preferably in the range of 10 to 500 mg/L and most preferably in the
range of 10 to 300 mg/L.

25

The aroma condensate is preferably 1 to 2000 g, more preferably 10 to 1000 g, most
preferably 50 to 500 g per kg of the dry mass of tea leaf.

It is possible to use methods of recovery of aroma other than condensation. The
aroma-laden vapours may be subjected to a step of contacting with an adsorbent. The
adsorbent is preferably selected from the group consisting of activated charcoal,
resins (e.g. polystyrene-divinyl benzene beads), zeolites, and tea (e.g. black tea). The
adsorbent which has been contacted with the aroma laden-vapours is preferably subjected to a further step of desorption. The desorption is preferably carried out by thermal treatment, or by contacting the adsorbent with organic solvents or super critical CO₂. The material separated from the adsorbent during the steps of desorption is termed as desorbed aroma.

The aroma condensate is preferably further concentrated to obtain an aroma concentrate. Any methods of concentration known in the art may be used: For example, the aroma condensate may be concentrated by reverse osmosis, distillation, cryo-concentration, freeze drying, and/or staged/partial condensation to prepare a tea aroma concentrate. It is particularly preferred to use the process of distillation for the concentration.

Alternatively the condensate could be concentrated in other ways; e.g. the condensate could be adsorbed on to one or more adsorbents selected from activated charcoal, resins (e.g. polystyrene-divinyl benzene beads), zeolites, or tea (e.g. black tea). The adsorbent may be packed in a column or fluidised bed and later desorbed to release the aroma components using thermal treatment, organic solvents or super critical CO₂.

The aroma concentrate comprises preferably at least 25 mg/L, more preferably at least 1000 mg/L, more preferably still at least 5000 mg/L total organic carbon. The total organic carbon in the aroma concentrate is preferably the range of 1000 to 500000 mg/L.

The process preferably comprises a step of deactivation of enzymes after the step (b).

The process preferably comprises a step of drying the tea leaf to moisture content of less than 10% by weight wt after the step (b) to obtain a tea product.
The step of drying may follow the step of deactivation or these two steps may be simultaneous. Preferably, the deactivation of enzymes is a thermal deactivation carried out by contacting the leaf with steam or air at temperature greater than 70 °C. The drying step is preferably such that the moisture content of the tea is brought down to a range of 1 and 10% and optimally to a moisture content of about 5% by weight.

Drying conventionally involves exposing the tea to a blast of hot, dry air in a high-convection dryer. It is well known that aroma is generated during this drying/firing process step which may also be recovered. However, recovery from such high-convection dryers, results in a dilute aroma, requiring excessive concentration. Thus a low-convection dryer as described in EP1926386 (Unilever, published in 2008) may be used to recover aroma, in addition to the aroma recovered by the process of the present invention.

The invention will now be described, by way of example only, with reference to the accompanying non-limiting examples.

**Examples**

**Effect of the gas phase temperature and comminution**

Withered tea leaf (from South Indian garden) was macerated/comminuted to form dhool. In one experiment uncomminuted tea was used. 500 g of dhool (or uncomminuted tea leaf) was packed in a bed of 4 inches depth. The dhool had a moisture content of 75 wt %, on wet basis i.e. the ratio of water to dry mass of tea leaf was equal to 3. Air at various temperatures (as shown in the table below) was passed through the bed for 120 minutes at a flow rate of about 30 L/min. The water vapour content in the air was 12 g/ kg of dry air. The aroma-laden gas phase exiting the bed was fed to a condenser. The condenser was provided with the cooling water utility at 2 °C. The aroma condensate was collected from the condenser at the end of 120 minutes. The fermented dhool (100 g) was dried in a fluidized bed dryer with air at a temperature of 120 °C for 20 minutes to obtain a black tea comprising 5% by weight moisture. This step of drying may also be termed as firing.
Measurement of Theaflavins (TFs): Tea product (1 g dry weight) was extracted with 50 mL of 70% methanol (V/V) at 80 °C for 10 minutes. The liquor was allowed to cool to 25 °C and centrifuged. The supernatant was diluted and then fed to HPLC (Shimadzu LC-10AT model) and the TF content was determined.

The concentration of the aqueous condensate in mgs of aroma per litre of condensate was measured by a Total Organic Carbon analyser (Shimadzu Model 5000A). The amount of aroma captured from the said process was then converted in mg of aroma recovered per kg dry weight of the dhool material.

The black tea obtained at the end of the process was evaluated as follows. End-cup was obtained by brewing 2 g black tea in 200 mL hot water at temperature of 100 °C for 3 minutes followed by straining. Olfactory evaluation of the end-cup was carried out by an expert.

Table 1: Effect of the gas phase temperature and comminution

<table>
<thead>
<tr>
<th>Ex No</th>
<th>Temperature of gas phase in step (a)</th>
<th>Comminuted</th>
<th>Aroma condensate characteristics</th>
<th>TF content (mg/ g dry weight of tea product)</th>
<th>End-cup black tea evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>Aroma recovery (mg TOC/ kg dry weight of dhool)</td>
<td>Concentration (mg TOC /L condensate)</td>
<td>Green and floral</td>
</tr>
<tr>
<td>1</td>
<td>25</td>
<td></td>
<td>19.9</td>
<td>52.6</td>
<td>1.2</td>
</tr>
<tr>
<td>2</td>
<td>25</td>
<td>No</td>
<td>4</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>----</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>3</td>
<td>80</td>
<td>yes</td>
<td>43.1</td>
<td>85.9</td>
<td>1.0</td>
</tr>
<tr>
<td>A</td>
<td>90</td>
<td>yes</td>
<td>570</td>
<td>34.1</td>
<td>-</td>
</tr>
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</table>

- indicates not measured.

From the results, it is clear that the process of the present invention provides recovery of volatile aroma compounds in good yield and quality from the tea leaf. Furthermore, the process allows recovery of aroma during the processing of tea leaf without compromising on the quality of the tea product that is obtained from the tea leaf. It can be also seen that comminuted tea leaf provides better results as compared to uncomminuted tea leaf. It can be further observed that with the increase in the temperature of the gas phase in the step (a) from 25 °C to 80 °C, the aroma recovery is significantly improved (more than twice) whilst the theaflavins content drops marginally (by about 20%). Example no A in the Table 1 is a comparative example of the prior art, in which instead of gas phase having water vapour content of less than 30 g/kg of dry air of the present invention, steam (temperature ~90°C). The resulting recovered aroma characteristics are not acceptable as shown in the table.

15

**Effect of the ratio of water to dry mass of the tea leaf**

The experiments were carried out by varying the ratio of water to dry mass of the tea leaf under otherwise identical conditions of Example 1 as tabulated below (the relevant data of Example 1 is reproduced again for convenience). In all the experiments, drying conditions and drying time were identical.

**Table 2: Effect of the ratio of water to dry mass of the tea leaf**
From the above results, it can be seen that the increase in the ratio of the water to dry mass of tea leaf adversely impacts the quality of the processed material and its subsequent drying time and energy requirements.

5  
Effect of process sequence

The experiment was repeated with altered process sequence. The process sequence was altered by carrying the said process (step a) post/after drying/firing/deactivation and pre/before firing/drying/deactivation operation. Rest of the experimental conditions remain same as given in example 1. The temperature of the gas phase contacted with the bed was 25 deg C.

Table 3: Effect of process sequence

<table>
<thead>
<tr>
<th>Ex No</th>
<th>Process sequence</th>
<th>Aroma Recovery (mg TOC/kg dry weight of dhol)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Step (a) – Step (b) - Firing</td>
<td>19.9</td>
</tr>
<tr>
<td>5</td>
<td>Firing - Step(a) - Step (b)</td>
<td>0</td>
</tr>
</tbody>
</table>

15 From the results, it is clear that the deactivation (firing) step must be preceded by the process defined in step (b) in order to recover aroma.

Effect of the gas phase contact rate
The process of Example 1 was repeated by varying the rate of contacting of the gas phase with the tea leaf, keeping all the other conditions identical. The results are tabulated below.

5 Table 4: Effect of the gas phase contact rate

<table>
<thead>
<tr>
<th>Ex No</th>
<th>The gas phase contact rate (kg air / kg dry mass of tea leaf/ hour)</th>
<th>Aroma Recovery (mg TOC/ kg dry weight of dhool)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13.8</td>
<td>19.9</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>29.5</td>
</tr>
<tr>
<td>6</td>
<td>0.3</td>
<td>1.8</td>
</tr>
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</table>

From the results, it is clear that the best results in terms of aroma recovery are obtained at a selective range of the gas phase contact rate.
Claims

1. A process for preparing a tea product characterized in that the process comprises the steps of:
   a. contacting tea leaf with a gas phase to obtain aroma-laden gas phase, said gas phase comprising less than 30 g water vapour per kg of the gas phase on dry basis, and;
   b. recovering aroma from the aroma-laden gas phase by subjecting the aroma-laden gas phase to:
      i. a step of condensation to obtain an aroma condensate, optionally to a further step of concentrating the aroma condensate to obtain an aroma concentrate, or;
      ii. a step of contacting with an adsorbent, optionally to a further step of desorption;
   wherein and the ratio of water to dry mass of tea leaf is less than 5 during the step (a), and the step (b) is prior to a step of deactivation of enzymes in the tea leaf.

2. A process as claimed in claim 1 wherein the gas phase is at a temperature less than 150 °C.

3. A process as claimed in claim 1 or 2 wherein said tea leaf is comminuted tea leaf.

4. A process as claimed in any one of the preceding claims wherein the gas phase is contacted with the tea leaf at a rate of 0.01 to 50 kg of the gas phase per kg dry mass of the tea leaf per hour.

5. A process as claimed in any one of the preceding claims wherein said gas phase comprises oxygen.

6. A process as claimed in any one of the preceding claims comprises a step of deactivation of enzymes after the step (b).
7. A process as claimed in any one of the preceding claims comprising a step of
drying the tea leaf to moisture content of less than 10% by weight after the step
(b) to obtain a tea product.

8. A process as claimed in any one of the preceding claims wherein said aroma-
laden gas phase is subjected to a step of condensation to recover the aroma
condensate.

9. A process as claimed in any one of the preceding claims wherein the aroma
condensate comprises total organic carbon in the range of 1 to 1000 mg/L.

10. A process as claimed in any one of the preceding claims wherein the aroma
condensate is 1 to 2000 g per kg of the dry mass of tea leaf.

11. A process as claimed in any one of the preceding claims wherein the aroma
condensate is subjected to a step of concentrating the aroma condensate to
obtain an aroma concentrate.

12. A black tea or oolong tea comprising the aroma condensate or the aroma
concentrate or the desorbed aroma according to claim 1 where the material
separated from the adsorbent during the desorption is termed as desorbed aroma.

13. A black tea or oolong tea as claimed in claim 12 wherein the aroma condensate or
the aroma concentrate or the desorbed aroma is from 0.01-10% by weight.

14. A ready-to-drink tea comprising the aroma condensate or the aroma concentrate
or the desorbed aroma according to claim 1.

15. A ready-to-drink tea as claimed in claim 14 wherein the aroma condensate or the
aroma concentrate or the desorbed aroma is from 0.01-10% by weight.
**INTERNATIONAL SEARCH REPORT**

**A. CLASSIFICATION OF SUBJECT MATTER**

<table>
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<tr>
<th>INV.</th>
<th>A23F3/42</th>
<th>A23F3/16</th>
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According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

A23F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

<table>
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<tr>
<th>Category*</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
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<td>WO 2009/083420 A1 (UNILEVER PLC [GB]; UNILEVER NV [NL]; UNILEVER HINDUSTAN [IN]; RASTOGI) 9 July 2009 (2009-07-09) cited in the application page 4, line 28 page 6, line 1 - line 5 page 13, line 6 - line 14; claim 1 -----</td>
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X Further documents are listed in the continuation of Box C. 

X See patent family annex.

* Special categories of cited documents:

- **A** document defining the general state of the art which is not considered to be of particular relevance
- **E** earlier document but published on or after the international filing date
- **L** document which may throw doubt on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- **O** document referring to an oral disclosure, use, exhibition or other means
- **P** document published prior to the international filing date but later than the priority date claimed

**Date of the actual completion of the international search**

18 February 2011

**Date of mailing of the international search report**

28/02/2011

Name and mailing address of the ISA/

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Authorized officer

Saunders, Thomas
<table>
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